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E. M. Baker

The Monthly Review of the AMERICAN ELECTROPLATERS' SOCIETY

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FEBRUARY 1941

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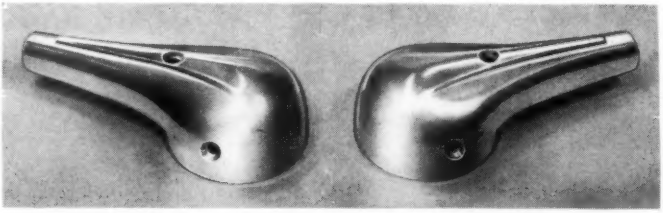

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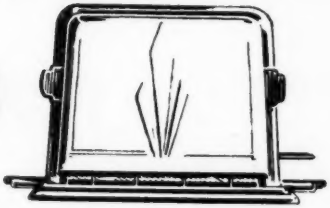

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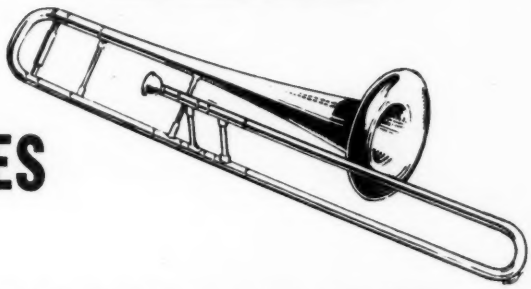

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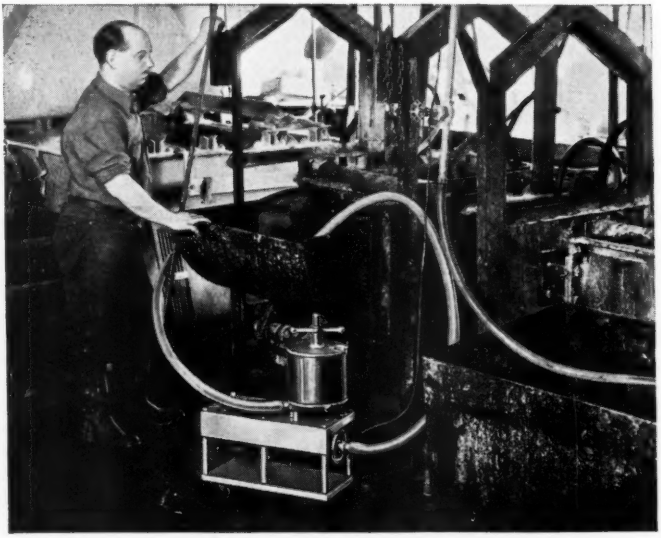

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The MONTHLY REVIEW

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Editorial

At a recent meeting of the Executive Board of the American Electroplaters' Society, it was decided to write to the advisory council of National Defense offering the services of the Society to assist in the National Defense Program, such action having been taken by other Societies similar to ours.

On January 10 the following letter was mailed:

Mr. Leon Henderson,
Advisory Council of National Defense
Munitions Building
Washington, D. C.

Dear Sir:

The American Electroplaters' Society is a group of men who are active in the research and production of all phases of electroplating. The Society itself is the meeting ground for exchange of information and ideas and is at present actively cooperating in a research program being conducted at the National Bureau of Standards.

We would like to offer the services of our Society and its members to assist in the National Defense Program in any way possible. If there are any problems in which we can assist, either the elected officers or the executive secretary will be glad to cooperate on the problems and put your Council in touch with members who have specialized knowledge and experience on the particular subject involved.

It is our understanding that a census has been taken of the members of other Societies to obtain information on the talent available and we believe that a similar census could be taken of the members of the American Electroplaters' Society with equal success.

Please be assured that we are willing to cooperate in all ways and will consider it a pleasure and a duty to help at any time.

Very truly yours,

E. T. CANDEE, *1st Vice-Pres.*
W. J. R. KENNEDY, *Executive Secy.*

The War Influence *on the* Cleaning *and* Plating *of* Metals

By MR. F. E. P. GRIGGS
Canadian Hanson-Van Winkle Co., Ltd.

Read at joint meeting of Buffalo-Toronto Branches, Niagara Falls, Feb. 8, 1941.

WHEN Canada's war program started about 18 months ago, many of us in the metal finishing industry wondered what our contribution to the National effort was going to be. No doubt many of you in the United States are wondering just how it is going to affect your particular industry. After 18 months of active war industry in Canada, I can tell you very honestly and quite proudly that the metal finishing industry's contribution in its broadest sense has assumed very real importance under war conditions. All war materials are finished in some way or another, and the intelligent use of modern processes, many of which have had to be specially adapted, has already saved the purchasing powers many thousands of dollars in reduced labor costs, fewer rejects and increased production.

Increase in machine tool cutting speeds has meant the use of flowing lubricants with consequent degreasing problems, which is in marked contrast to production during the last war when, for example, most shells were made on single purpose turret lathes, running dry, and the same problems, for the same reasons, have occurred on fuse, primer and gain production. Airplanes of the 1914-1918 vintage were almost entirely fabricated of wood and fabric, and the present-day use of aluminum and light alloys has presented another challenge to metal finishing technique.

The development of modern varnishes, shellacs and lacquers has placed a premium on cleanliness and metal surface preparation. The use of modern atmospheric controlled furnaces has made it imperative that clean work go to the furnaces, and the savings in material, acid and labor in pickling have not been inconsiderable. So far, with the exception of cadmium and zinc, the actual amount of plating has not been great. All straight steel parts of airplanes are cadmium plated before applying the

final paint finish. Zinc plating on army trucks, armored cars and the like is very considerable.

Some experiments are now being conducted on the use of chromium plated hot forging dies for shell production; and the chromium plating of jigs, gauges, etc., is more general in war time industry than in peace time. We understand the Canadian War Office is specifying chromium plate on all new gauges. The pickling of brass shell cases is a big job. In the production of the 3.7 anti-aircraft cartridge cases there are seven separate pickles after annealing and between draws, and the layout of this, on either an automatic or hand-operated basis, has meant some good planning.

The anodic treatment of aluminum is almost standard for airplane production; and further than this, aluminum is now coming into use on actual shell fuses. The development of anodizing equipment and its application under high production conditions has been one of the most interesting problems yet tackled, and on which a good degree of success has been attained. I would like to come to this again.

As well as the above processes, other metal finishing problems are legion, and some of them are the browning and blackening of machine gun, rifle and similar parts, and acid dipping and finishing of metal parts for optical instruments, rustproofing of fuse parts, and a host of similar processes. I feel it would clarify our discussion, and provide a more sympathetic approach to the metal finishers' problems if we were to outline three fundamental points in considering war time production.

As a first example, let us take the finishing problem on a standard time and percussion fuse. The 24 odd parts are formed from stock conforming to the correct analysis, and as the parts go to the final finishing the metallurgical characteristics are set and can be maintained within close limits. Machine operations can be accomplished to given accuracy of final shape within normal machine tolerances. The only variation that can occur from now until the fuse is used is the ability of the protecting finish or finishes to keep all the parts in good working order. We as manufacturers must realize that, in the main, the standards of use that have been set up for essential war materials are based on long years of quiet and detailed study, and just because we

feel an instrument of war may kill an unspecified number of the enemy is no criterion that it is really a suitable product.

General Locke has set up what should be aimed at as a guide to materials of war, and very roughly it is this: that materials of war should last storage for thirty years, could be used from Arctic to tropic temperatures, under conditions of extreme humidity or extreme dryness, under the earth or in the sky, and, most important, shall be completely interchangeable; that is, the parts of the machine gun in South Africa must be interchangeable with parts of the same gun in Canada; firing bullets made in England from copper rolled in the United States. Peace time materials, in the main, do not have to stand up against such wide conditions.

Another basic fact is that the production of war materials is essentially non-competitive. The stock the manufacturer can use is fixed. The finished shape, of course, cannot vary, and the finish is not only specified, but its method of application is also generally laid down. This, of course, does not mean that improved methods of application cannot be considered, but that fundamental results must be standard. For example, in finishing the inside of shells the methods of cleaning can and often do change, but the actual varnish coating standards must be maintained. That is, because we obtained a more adherent, uniform coating by doing a better cleaning job is no license to reduce the thickness of the varnish coating, even if it showed a higher strength and less porosity. War materials have never been, and cannot be, evaluated on the basis of accelerated tests, except perhaps under very special circumstances.

The third point I would like to bring to your attention concerns the selection of equipment, and this point is an economic one rather than a technical one. Suppose any of you were considering the purchase of a full automatic plating installation for toasters. The chances are that in considering such an installation it would be somewhat flexible in the work that it could turn out. That is, you would try to consider new models of other work of a similar nature. Such factors are often forgotten in the rush of war time work, and in my judgment should have very real importance. The first consideration, of course, is the efficient production of the particular war job for which we have con-

tracted, but if, without impairing that production, the same equipment, perhaps with small changes, can be readily adapted to peace time work, then I feel it is our duty to supply, and your duty to buy, such equipment.

This war is not going to last forever, and the easier and quicker we can get our industrial war time machinery back to peace time projects, the less will be the chance of currency inflation, and the better off will be the country as a whole. Highly specialized equipment lying in empty plants contributes nothing to a country's economic wealth.

There are three processes, all of them essential, which, it is quite likely many of you will be coming up against. The first, and I suppose the closest to most of your activities, is the cadmium plating of airplane components. These parts will run from almost any size and shape, such as in fuselage components, to small bolts and nuts. The process of cadmium plating is basically the same as is now carried on in industry. The standard cadmium cyanide solution is used, and free cyanide running from 5-8 ozs. per gallon. There are, however, two points which differ from most commercial cadmium, and these two points emphasize a general statement that I would like to make concerning war contracts. That is, that the preparation of the estimate for any war job should be sufficiently detailed that it constitutes a guide for the actual execution of the contract.

Of these two points, one in particular will profoundly influence the finished cost. The first is this: no aircraft components (except nuts and bolts) may be pickled prior to cadmium plating, but must be sandblasted. Frankly, there are certain isolated instances where the inspectors have allowed pickling, but in the main the above statement is correct. The probable reason for this is to preclude any possibility for acid remaining on the inside of tubular parts, the effect of which might be very disastrous at some point in the plane's life. The phenomenon of hydrogen absorption also probably enters into this ruling. The other point is that any pickling must be done in a fully inhibited acid, and after the work has gone through the plating cycle it must be held at a temperature not less than 225° F., for not less than one-half hour, to free any absorbed hydrogen.

The average thickness of cadmium deposits runs about

3½/10,000ths, and the tests to which it is subjected are the usual ones for thickness of plate, appearance, freedom from blisters and porosity. These parts are the three main components of a new type of shell fuse developed in England and hithertofore not made in Canada—and, I think, not in the United States as yet. They are the fuses used in the Bofors gun shell which has given such a good account of itself in anti-aircraft work.

In January, 1940, this company approached us to build them anodizing equipment. The process to be used was the Bengough & Stewart, using 3% chromic acid—the time of treatment to be one hour, the voltage time curve as follows:—Start with 0 volts and raise to 40 volts in 3-volt steps over 15 minutes. Hold for 30 minutes at 40 volts and then increase the voltage in 5-step steps over 5 minutes and hold at 50 volts for the balance of the hour. They gave us the production required in pieces per day, and left the problem up to us. We were not able to obtain agreeing data from either the literature or several visits to aircraft companies doing anodizing on the current densities occurring on the above voltage range; apparently because different surfaces of aluminum seem to draw more or less current.

As an alternative test it would have been a simple determination on the items in question, but it was difficult to obtain a suitable current supply. This, however, was settled by using the batteries on our factory telephone system and increasing the voltage as per the above schedule by putting an increasing number of cells in series. This enabled us to go up to 48 volts, which was as high as we could go, and we obtained a figure between 4 and 5 amperes per square foot, and took note of the current surge when the voltage was increased; that is, on an increase in voltage, particularly when the voltage was about 40 volts, there was a marked surge of current which dropped back after a few seconds to a more or less constant figure. It was difficult to get this accurately, but it seemed to be from 35-50% above the steady current for any particular voltage, with a maximum surge at 40 volts.

An accurate measurement on the area of the pieces and the production on a one hour and ten minute cycle (ten minutes for loading and unloading the tank) enabled us to determine the size of the M.G. set. The control panel for the generator had

mounted thereon a recording voltmeter and ammeter, which tell the story of any particular batch of pieces. We have since discontinued the use of the recording ammeter, as the voltage is really all that matters.

An air circuit breaker was provided, and its interesting point was that it must have an inverse time limit overload relay. By this I mean that the breaker was so designed that it had to stay above the breaking point a definite length of time before the circuit is opened—otherwise it will continually be kicking out on the 35—50% surge current, which I previously mentioned. A potentiometer type rheostat on the generator fields and the exciter field rehostat are manually operated to give the correct time voltage curve. A main disconnect switch and electric clock complete the panel.

The anodizing tank proper was fabricated from $\frac{1}{4}''$ plate, and had a built-in ventilation duct, and the amount of air pulled for ventilation was approximately 75%, the same as used for chrome plating installations. A positive pressure blower for air agitation, together with coils for heating or cooling the solution were provided. S. S. cathodes are used. It was decided to forego temperature control, as the solution operates at 100 degrees Fahr., plus or minus 5 degrees, and could quite readily be held by hand. A three-stage trichlorethylene degreaser and hot and cold rinse tanks completed the job from the point of view of equipment.

The only point left, and believe me it turned out to be a major one, was how to handle the work. Practically the only anodizing done by this process in Canada is airplane components, and the only thing close to our job was aluminum rivets. These are handled in a basket provided with a screwed-down lid, the contact being made from the lower face of the lid. It was intended to lay layers of aluminum wire between the layers of fuses so that when the cover was clamped down positive contact would be made. It was figured that once a basket had gone through the anodic cycle it would be almost insulated, and therefore all the current would go to the fuses. We were very much perturbed when our generator, which should have handled eight of these baskets, would handle only two without going over its rated capacity. That wasn't all our grief either. The operators were getting about 20% non-anodized production and on the

anodized ones there were distinct wire marks where contact was made by the pressure of the top cover.

The answer to the first problem, the excessive current being drawn, was only revealed by accurate chemical analysis. On a cover plate observed, the plate itself is quite normal, but the ribs and some of the welds seem to be dusting away. The cover is 2-S aluminum and the ribs and welding rod, where gone, are 17-S. Now 2-S will anodize quite O.K., and so will 17-S, but apparently when welded the current preferentially acts on the 17-S. This meant that we were getting abnormal current density on the 17-S and the 2-S was not taking as it should. The substitution of 2-S completely eliminated the trouble but while we were having this done our customer tried wiring the work and obtained such good results that it was continued as standard practice. Labor costs were lower, rejects dropped to zero, and a higher production per ampere more than offset the cost of the aluminum wire. About 20 of these parts are strung on a wire, and the ends of the wire held between spring clamps. There are about 10 wires per rack.

Shell production still remains as one of the big items in war time production. The forgings are machined all over the outside and in the main shotblasted on the inside. The finishing problems are not complicated, but have necessitated some interesting work. As you know, the shell is closed at one end and the opening for the fuse and charge is quite small—about 1⅞" I.D. The face of the nose is curved and a thread milled on the inside of the nose. The inside of the shell is heavily contaminated with cutting oil and chips. The cleaning was done, previously, by a gang of men with solvents, rags and compressed air. The job was accomplished with trichlorethylene in a specially designed degreaser. The shells are placed either by hand or hoists (nose down) in shell guides, the inside contour of which corresponds with the outside contour of the shell. A nozzle comes up on the inside of the shell and solvent is sprayed up for 15—25 seconds, and the shell remains in the degreaser for about 2 minutes, depending on the size. The spraying accomplishes two things, dislodges chips and heavy oil and displaces the air so that the vapor can get up and complete the cleaning with condensed solvent.

In the main, these units have been for relatively low productions, 100—120 hr. 25 lb. shells, as generally shell units are quite small, and a big shell plant (we have one of the largest in the world in Canada) has several shell lines each with its own degreasers, spray setups and baking ovens. An interesting point in connection with all munition finishing is the requirement that all finishes or even methods of finishing must be free of lead in any form. Apparently there is a delayed action between high explosives and lead. We even had to take samples of the galvanized coatings on the degreasers and satisfy the inspection branch that lead was not present, and we have taken special precautions in galvanizing these tanks that there is no lead bottom in the kettle as is often carried by the galvanizers.

In going over specifications of war manufacture and in the actual manufacture a process is laid out and sometimes it is stated that proprietary processes or alternate methods may be used. This sounds like a small point, but if and when you do get approval on a change, make sure that the inspection branch is notified well in advance, as I have often seen tests applied for parts fabricated by a changed method, to which the inspector applies his handbook tests which may not apply to the changed method, despite the fact that the product is equally as good, but made in a different way.

In getting this paper together I have been very fortunate in having the guidance of many men in munitions work, particularly Mr. Arnold Thompson of Canadian Acme Screw and Gear Company in Toronto. Mr. Thompson has had a lifetime of experience in automotive and munitions work. He is in charge of all tool design and operation planning at this plant, and of necessity has had to inaugurate a school of tool makers and tool engineers. He said he would like to have a plater among them, as plating is essentially a tooling proposition. If he were talking to us now I don't think he would call us platers, but process engineers. He asked me to suggest to you that particularly on war production we work in the closest way with the planning department. Mr. Thompson does not think or plan anodizing, plating, bonderizing, etc., as a single department. These operations are handled in the same general way, machine operations are handled in straight line and the equipment locations are based

on the same general principles that guide the location of a machine tool.

I have made a reasonably accurate survey of five large plants on munitions work, and you will be amazed to know that the universal opinion was that about 50% of all rejects were caused by faulty finishing or process engineering, and that the reprocessing of parts usually cost anything from equal to three times the finished cost of the article in question. You see, machine operations are right or wrong, and the gauges say so, but processing results in many cases are a matter of opinion. In a production plant differences of opinion cost money, and if we the platers and process engineers can plan our work, execute it so that variations in results cannot occur, the contribution which we are making now will be of increasing value. I think that 50% of all rejects should be a challenge to us as a group.

MR. SODERBERG WILL SPEAK AT SYRACUSE MARCH 28

We have just received a letter from Mr. Gustaf Soderberg of the Udylite Company that he has accepted our invitation to speak at the Binghampton-Syracuse meeting of the A.E.S. at Syracuse, March 28.

His subject will be "Plating Room Control." We deeply appreciate Mr. Soderberg's acceptance as he is one of the most popular speakers to platers. We should have a large attendance at this meeting not only from Syracuse but from those interested in plating in this section.—Ed.

WATCH YOUR BLOOD PRESSURE, DOCTOR

HEAR YE: HEAR YE:

Come June there is going to be one of the gol-darndest plating Conventions we have ever seen. And come the Convention there is going to be one of the darndest base-ball games there ever wuz.

Colonel Barron has asked me to take charge of the game and I in turn am asking Mr. Frank Savage and Mr. Rudy Hazucha to be co-captains of the Western team. The reason for this is that the West will need at least two captains to attempt to hold this all-Eastern team being formed. Boy, what a team! We would like to warn those Westeners rite now that they are going to have everything thrown at them, including baked beans and gold plated base balls. We are going to run Rudy past Chicago to Milwaukee, and Savage will blow and then blow by his home town. Watch out for this all-Eastern cyclone calamity which will hit the West around the belly band. We guarantee, Suh, that the game will be played in Boston, but there will be plenty o' Southern accent minus the broad A. More concerning the plans in another issue.

C. B. F. YOUNG, Captain, Ex-Officio

A Development *in* Full Automatic Silver Plating

By FRANK K. SAVAGE and PAUL R. PFEFFERLE

Read at Chicago Branch Annual Meeting, January 25, 1941.

We acknowledge, with thanks, the publication permission granted by the engineering department of Michigan State College where the content of this paper is being used as part of a thesis for an advanced degree. We also wish to thank the management of C. G. Conn, Ltd., for permission to use the inclosed information.

We wish to present a short resume of a very interesting development in automatic plating. We have practically nothing new as a result of pure electrochemical research to give you. We do have, we believe, a unique cycle and a development worthy of presentation. Many problems encountered in copper and nickel plating have been solved.

Previous to this development in automatic plating, our silver plating was done in thirteen different solutions varying in volume between fifty and sixteen hundred and fifty gallons each. This largest solution was a semi-automatic which was served by an eight hundred gallon semi-automatic strike. The total volume of solution used was six thousand six hundred gallons.

The solutions were the conventional cyanide-carbonate type operated at room temperature with only slight cathode agitation in some instances. With this system it was often necessary to plate two hours to obtain required deposit weights. Due to the extremely deep recesses in our work, our limiting current density was somewhat less than if flat work were plated. We speak of deposit weights since all of our specifications are written in pennyweights per piece and vary only roughly as to area and more actually to what many years of field experience has shown to be necessary. The attitude is taken by our sales organization, and rightfully we believe, that the instrument must stand wear and perspiration conditions that the average user feels is reasonable. In this connection it is fortunate that in nearly every instance the exposed sections, the high current density areas, the places normally receiving the most deposit, are the

places that receive the most wear and perspiration exposure. Otherwise it would be necessary to apply many times the present weight of silver.

Too elaborate consideration of current densities in band instrument processing is futile due to the fact that the current density is undoubtedly different at every point on the work surface. Even average current density measurements are vague due to the impossibility of measuring with any degree of accuracy the effective cathode surface. A band instrument is full of concave tapers, cones, spirals, and elaborate ornamentation which makes area measurement difficult even if it meant anything after it was measured. We therefore, for the sake of economy, use as high a current per piece as is permissible and depend upon weight charts almost entirely.

The following is a representative cycle of our former silver plating procedure:

1. Base Metal—copper, brass, nickel silver, and bronze in the form of tube, sheet, rod, and castings.
2. Alkaline Clean—Cathodically.
3. Bright Dip—Nitric-Sulphuric acid.
4. Scrub—Pumice.
5. Rinse.
6. Blue Dip—Mercury.
7. Rinse.
8. Silver Strike—5 to 15 minutes.
9. Silver plate—2 hours.

Not much discussion of this cycle is given or needed. Our work on alkaline cleaners has previously been published in the REVIEW[1] and the whole cycle with complete explanations has been published in "*Metal Industry*"[2].

Offhand this may look like a difficult cycle to conveyerize. However, a program was laid out as follows: 1. To establish a cleaning and pickling cycle which would eliminate hand scrubbing (for the sake of economy) and bright dipping (due to corrosive and poisonous fumes and to the extremely short immersion time permissible). 2. To eliminate the use of mercury because of its difficulty of control and the very short permissible immersion time. 3. To find a very much faster method of depositing silver so that manual transfer from a full automatic to other units would not be necessary. 4. To find a real bright silver so the

(1) The Monthly Review 445-6-38
(2) Metal Industry 133-3-40

subsequent finishing could be minimized. 5. To provide racking technique for all work instead of wiring which included auxiliary anode arrangements where needed.

Of all the above propositions the fourth, bright silver, was the only one upon which we stumbled. We reviewed and searched literature and patents. We tried all the solutions we found proposed by others to the best of our ability in view of information given. We tried many pet ideas of our own. We obtained special compounds as brighteners. A few of the things tried other than carbon disulphide were urea, thiourea, thiocarbanilamide, thio semi carbazide, mercaptans, and many other derivatives of organic materials containing sulphur. We obtained bright silver but not in a solution of the high permissible current density which was our first prerequisite. We also ran into serious difficulties with bath maintenance and narrow operating characteristics in some cases. This phase of the research was therefore temporarily abandoned.

The silver solution proposed by Donald Wood[3] of the Reed and Barton Corporation at the New York Convention was found to be acceptable. We found that we could cut our silver plating time to fifteen or twenty minutes, obtain wide operating limits, obtain very smooth semibright deposits easily scratch brushed, buffed or burnished, and easily maintain the solution. The solution is as follows:

PLATE

Silver—2.00 — 2.25 oz.T./gal.
Free Cyanide (NaCN)—2.3 — 3.0 oz/gal. (.35-.45 N)
Potassium Nitrate—16 oz/gal.
Carbonates—.40 N. Max.
Bath Potential—Approx. 1 Volt.
Current Density—Approx. 5 —20 Amp/sq. ft.
Temperature—30 to 35° C. (86 to 95° F.).
Time—Seventeen minutes.
Agitation—Cathode oscillation.

STRIKE

Silver—.5 — .8 oz. T./gal.
Free Cyanide (NaCN) 6 — 7 oz/gal.
Potassium Nitrate—16 oz/gal.
Bath Potential—2 — 5 Volts.
Current Density—Approximately 5 — 40 Amp/sq. ft.
Temperature—Room.
Time—two to three minutes.
Agitation—Cathode oscillation.

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(3) Something New In Silver Plating, Donald Wood; Proceedings, American Electroplaters' Society, Twenty-Fifth Annual Convention, Page 150.

The pretreatment gave us a little more trouble. It was found, however, that with adequate soak cleaning of six minutes in a mild alkaline cleaner followed by a cathodic electric cleaning of two minutes, grease and dirt were removed. This involved a search for the proper cleaning compound. Scale, tarnish, and oxides were found to be removed in a solution of 32° Be. sulphuric acid[4] wherein the work is made the cathode at twenty-five to one hundred amperes per square foot for three minutes. This solution has twofold action. Oxides are removed chemically as in any pickling operation and since large quantities of hydrogen are liberated on the work surface there is undoubtedly some electrochemical reduction as well as prying action of the gas bubbles.

Most band instruments are assembled with the use of soft solder. This has long given rise to silver plating difficulties, particularly in deep recesses where the local cell action between the solder and adjacent brass surface may generate sufficient voltage to successfully oppose the plating cell potential at that point. This made it desirable to preplate with some metal with a high throwing power to cover the solder. Copper plated from a Rochelle salt-cyanide solution as reported by Graham and Reed[5] was found to be highly satisfactory. In addition to forming an adherent deposit on the soft solder the copper solution also does a certain measure of cleaning. The alkalinity and cathode gassing acts advantageously in removing slight imperfections in the previous cleaning and pickling steps. The solution is as follows:

Copper—2.5 — 3.5 oz/gal.
Free Sodium Cyanide— 5 — 1.0 oz/gal.
Sodium Carbonate—2.0 — 8.0 oz/gal.
Rochelle Salt—8 oz/gal.
Current Density—To produce copious gassing.
Temperature—55° C.
Bath Potential—4 — 5 Volts.
Time — One minute.
Agitation—Cathode oscillation.

Silver, due to its position low in the electromotive series has a decided tendency to deposit on copper, brass, and bronze by simple immersion. This tendency has been minimized in silver plating in a number of ways, one of which is by the use of a mer-

(4) Communicated, G. B. Hogaboom.
(5) A Study of the Rochelle Salt Copper Plating Bath. Graham & Reed, Met. Ind. 1, 12-37; 1, 2, 3, 4,-38.

cury dip which is more or less hazardous on thin, hard, brass cross sections due to its season cracking influences. We found that with careful control excellent work could be done without danger even on brass horn parts which are in some instances only ten to twelve thousandths of an inch thick, even though our good friend, Mr. John Feeley and others have objected to its use in the past. Another way is by the use of a series of silver strikes starting with a solution very low in metal content and rather high in free cyanide. Still another method is a preplate of nickel upon which silver has little tendency to deposit by immersion.

We experimented considerably with nickel deposits which we hoped would be sufficient without previous copper strike. Nickel deposits from conventional solutions have a well-known poor adhesion over soft solder. A nickel solution was tried which did give adherent deposits on soft solder. This solution was proposed by both Donald Wood[6] and N. E. Promisel[6] and had been developed originally for plating stainless steel. The solution is as follows:

Nickel Chloride—32 oz/gal.
Hydrochloric acid—16 fl. oz/gal.
Current Density—25 — 100 amp/sq. ft.
Temperature—Room.
Time—30 sec. to 2 minutes.
Agitation—Cathode oscillation.

It was found that soft soldered joints could be covered with adherent deposits without the use of copper strike but that the throwing power of the solution was not sufficient to cover deep recesses. We used it at length in pilot plant work on small horns very successfully without the previous copper strike but found that copper followed by hot nickel is not only desirable but necessary on larger, deeply recessed work.

The nickel solution finally decided upon to follow the copper strike was a modified hot Watts solution of the following composition:

Nickel Sulphate—27 oz/gal.
Nickel Chloride—6 oz/gal.
Boric Acid—4 oz/gal.
Magnesium Sulphate—4 oz./gal.
pH—5.4 to 5.6 Elec.

Current Density—As high as permissible (Ave. 20-40 Amps/ sq.ft.)
Bath Potential—4 — 5 Volts.
Temperature—50 to 60° C.
Time—3½ minutes.
Agitation—Cathode oscillation.

(6) Verbally Communicated.

It has been claimed that the adhesion of silver to electrodeposited nickel is poor. We believe that under the proper conditions of depositing silver this is not a problem and that nickel is an ideal undercoating for silver. Much of our work is hand burnished subsequent to silver plating which is a rather severe adhesion test. We did find, however, that the corrosion resistance from perspiration is greatly increased with the nickel undercoating.

After the above solutions and operating conditions were established as far as possible on a laboratory scale, a small pilot plant was set up using fifty gallon solutions wherein small horns such as cornets, trumpets and clarinets could be plated. Here the process was perfected so far as possible in such a limited space. Roughly one thousand horns were plated in this set-up and a complete log of operating conditions was kept which included the instrument number and all deposition data in each solution. All variables in the plating process such as immersion time, temperature, current, and bath compositions were established as to maximum and minimum permissible variation. Here a fairly clear picture of the ultimate complete cycle was gained.

The next step was to construct another pilot plant of the process in the light of experience gained previously. This consisted of a series of three hundred gallon solutions. Here the previous conditions were checked wherein a number of the smaller pieces were plated on a rack at the same time. Much work was also done on larger pieces such as baritones, French horns, and euphoniums. The racking problem was here seriously attacked and auxiliary anode fixtures were made where needed. Roughly three thousand instruments were processed while this work was being done. Data was as conscientiously tabulated on all variables as previously. We were then in a position to specify with confidence what we wished in a conveyer cycle. The complete cycle as specified was as follows:

1. Soak alkaline cleaner
2. Cathodic electric cleaner
3. Hot rinse
4. Cold rinse
5. Cathodic sulphuric acid
6. Cold rinse
7. Copper strike
8. Cold rinse
9. Cold rinse
10. Nickel strike
11. Cold rinse
12. Cold rinse
13. Silver strike
14. Silver plate
15. Drag-out recovery
16. Drag-out recovery
17. Hot rinse

Incidental to this process we found that if we kept about one hundred pounds of zinc borings and turnings in the bottom of each of our drag-out tanks, the silver was precipitated completely, eliminating an elaborate counter flow system. Numerous analyses have established the completeness of this precipitation.

During the installation of the conveyer, sufficient racks were made and solution prepared so that the day after the erection engineer finished the final mechanical adjustments, the machine was taking care of by far the greatest part of our silver plating.

The band instrument industry is a comparatively small one in contrast to steel, automobile, and others of our well-known large industries. Our plant employs in the neighborhood of one thousand to twelve hundred workers. These buildings house the offices and sales organizations.

The cornets present some racking difficulty. The biggest problem is to keep the solution out of the inside of the horns during the plating process. All openings are corked tightly. The left hand vertical side of the rack is a hollow tube which extends above the solution level. The opening extends through the horizontal members that support the horns and through the corks in the bells. In this way the corks can never be blown out by expanding air when the work is in a hot solution. Electrical contact is made inside the horn beyond the cork.

The oil compressor for the operation of the machine is run entirely by hydraulic mechanism. A small hydraulic motor operates the indexing drive. The lift is operated by cylinders behind the plating cells.

As the tenor saxophone is one of the open type horns where parts of the interior can be seen, it is desirable to plate the horn inside as well as outside. This can be more or less easily done through the rather large tone holes. The only place difficulty is encountered is inside the bell proper where there is a rather large surface without openings. This is taken care of by an auxiliary insoluble anode of pure electrolytic nickel.

In plating trombones, an anode of silver is placed around the supporting member inside the bell to properly distribute the plate. Another anode is also placed opposite the tuning slide to help overcome contact resistance of the slide. Here again

part of the rack is made up of a hollow tube to vent the inside of the bell.

Probably the most difficult silver plating job we have conveyerized is sousaphone bodies. There is an octopus anode arrangement of insoluble nickel anodes around the valve assembly as well as an anode in the opening at the bottom. This horn is carefully corked and vented through a small tube at the top. A forty pound lead weight is necessary to overcome the weight of water the horn displaces in order to keep it from floating. The elevator lift is four feet and the transfer time twenty seconds. The immersion time per station is one minute. The distance between carrier centers is three feet.

When a rack of work enters the silver strike, a rather high current is used to start the silver plate in an adherent form. The cathode oscillation is twenty-four per minute with a four inch stroke. The agitator arms are driven by a motor and gear reducer on top of the machine.

The silver plating tank used is of thirty-four hundred gallons capacity and has twelve carrier positions. The anodes are forty inches long and weigh a total of fifteen thousand ounces troy. The machine is a Hanson-Van Winkle-Munning elevator type full automatic and is sixty-six feet six inches long, twelve feet wide and twelve feet four inches high.

The engraving is an interesting operation. The patterns and name on all horns are hand engraved before plating. Many silver plated horns are satin finished. These are given a light sandblast with fine sand before plating and scratch brushed after plating. The patterns on all horns are hand burnished and if a bright finish is desired in either silver or gold they are hand burnished all over.

It is necessary in every well regulated plating plant to check solutions carefully. Our control laboratory is used not only for solution control but is also a clearing house for all production difficulties of a chemical or metallurgical nature. Corrosion testing is done by oscillating a test plate at a constant speed and constant load over a felt pad until breakdown. The felt pad is kept wet with synthetic perspiration.

In our research and development plant many new ideas and

processes are worked out. Here pilot plant work is carried out without too greatly interfering with production schedules.

We wish to thank all our friends who have contributed ideas and helpful suggestions to this development. In particular, we wish to acknowledge the advice of Dr. George B. Hogaboom and his associates. Also the information gained in conversations with Donald Wood, N. E. Promisel, and Henry Smith, our progressive friends in the east. Paul Pfefferle, the co-author of this paper was cameraman, lighting engineer, and projector operator for the moving picture shown with the presentation of this paper.

DETROIT BRANCH NEWS

For our February meeting, there were approximately 175 in attendance to listen to Mr. E. A. Anderson, of New Jersey Zinc Company, and Mr. M. R. Caldwell, of W. B. Jarvis Company discussing factors in the Electroplating of Zinc Base Die Castings. Mr. Anderson introduced his paper as a "Talk on what we Do Not Know about Plating in General, and the Plating of Zinc in Particular." He began by pointing out that there are only three commonly used alloys for die castings which are essentially the same except for the percent of copper present. Zinc base die castings are, as a rule, very uniform and it is very seldom that plating trouble can be traced to the defects in the casting.

The difficulties commonly experienced in plating on zinc die castings are (1) Plating blisters, (2) Blisters caused by corrosion of the base metal and lifting of the deposit by the entrained corrosion products, and (3) Failure of the plate itself. The first class is commonly met with in the copper-nickel-chrome type of plating, and can be traced to the formation of a diffusion layer. This was shown by slides of micrographs to be accentuated by increasing the time of cleaning, and also by not buffing. Several theories were discussed for the formation of the blisters. Excellent photographs were shown with discussion of the other two types of blistering failures.

The highlights of Mr. Caldwell's paper follow:—In April of last year, an extensive program was started in endeavoring to develop a better method of cleaning zinc base die castings so that blisters in the field would be reduced to a minimum. The test was quite extensive in that over 2,000 pieces were plated on the roof for outside exposure tests. They were all plated under standard conditions with only one variable at a time.

Several slides were shown which demonstrated the results of the inspections which were at the end of eight months' exposure. After examining the figures, the following conclusions were made:—

1. Baking tests and outside exposure tests at the end of 8 months definitely do not agree. The outside exposure test is much more severe than baking at 300° F. for three hours. However, baking tests are indicative as, in every case where blisters have developed on the roof, there were also blisters when baked but to a lesser degree. Increasing the time of baking does not improve the test as several plates were baked six hours which did not develop further blistering. Blistering that develops during baking usually occurs during the first hour.
2. When using a high sodium metasilicate cleaner, the time for applying reverse current should not be less than 10 sec. nor more than 45 sec.
3. When using a high sodium metasilicate cleaner, the acid dip should not be weaker than 2% nor stronger than 7½% sulphuric acid for buffed areas.

For unbuffed areas, it appears better to operate the acid above 7½% sulphuric. This conclusion is apt to be entirely different when cleaning with a low or nonsilicate cleaner.

4. Cleaners with high active and total alkalinities clean better in a wash machine but cause blisters to develop when baked, and when exposed to weather. This applies to all silicate or nonsilicate cleaners tested.
5. Cleaners having low or no sodium metasilicate in them when used in the wash machine or electric cleaner anodically have withstood the tests as well as any others used. Therefore, as silicates are not as free rinsing, it is advisable to keep them as low as possible. This is substantiated by the fact that we have not received as many complaints this season when using a low silicate electrolyte cleaner as in previous years.
6. The voltage applied to a cleaner when being used anodically should be comparatively high. That is, 10-11 volts is preferable over 4-5 volts.
7. Degreased die castings followed by a weak electrolytic cleaner when cleaned either cathodically or anodically or in combination of the two have not proven to be better than those cleaned by the wash machine method. This means that the method adopted in any plant depends upon the parts, equipment available and ultimately the cost involved.
8. Chromic acid contamination in a high silicate cleaner when being used anodically is not detrimental up to 1 gm./L.
9. A soak tank containing neutral soap previous to a wash machine will soften the tripoli and is not detrimental as far as the development of blisters is concerned.
10. When using mineral spirits to remove or soften tripoli, an emulsifier should be used, otherwise blisters are certain to develop on outside exposure tests.
11. The pH, and active alkalinity of a low silicate electric cleaner does not change when holding the total alkalinity at a certain figure. Therefore, a pH test or an active alkalinity test has no advantage over a total alkalinity test for control purposes.

The question box conducted by Dr. Saltonstall had Mr. Anderson, Mr. Caldwell, Mr. Cole and Mr. W. M. Phillips, Jr., as the answer men in the round table discussion.

Our next meeting on March 7, will have Mr. R. M. Wagner, of Guide Lamp Division, General Motors Corporation as speaker. The talk will be in Mr. Wagner's usual interesting style, giving us plenty to think about.

HERMINIE DOROTHEA PROCTOR AWARD

Dear Mr. Proctor:

It was with the greatest pleasure that Dr. Faust and I received the information that our paper, entitled: "Metallurgical Aspects of Hydrogen in Electroplating," had been selected for the Herminie Dorothea Proctor Award as being the best paper presented at the 1940 Convention of the American Electroplaters' Society.

The occasion of this Annual Meeting was my first acquaintanceship with the American Electroplaters' Society, and I wish to take this opportunity to congratulate you as its Founder for the splendid organization you represent. The management of the Convention, the type of men in attendance and the calibre of the other papers presented were such as to make us especially proud that our work received such recognition.

Your personal certified check for One Hundred Dollars ($100.00) in payment of the Award has been received and Dr. Faust joins me in thanking you sincerely for this share that we have received through your foresight and generosity. We assure you that receiving the Herminie Dorothea Proctor Award will inspire us to extend our work along the lines of fundamental research in electroplating.—CARL A. ZAPFFE

(This letter was sent to Mr. Proctor shortly after the Convention. However, Dr. Zapffe has just recently sent us a copy for publication.—Ed.)

NEW HAVEN BRANCH ACTIVITIES

The course in "Practical Electroplating" is proceeding with the usual enthusiasm. Interest and attendance has kept up above the average of previous years. The following lectures have been carried out to date:

November 12, 1940. Motor-Generators. Rectifiers. Comparison and use in operation. Clarence Garner, Plant Engineer, International Silver Company, Meriden, Conn.

November 26, 1940. Construction, Workings, and Use of Voltmeters, Ammeters, Rheostats, Bus Bars, and Plating Tanks. Clarence Garner, Plant Engineer, International Silver Company, Meriden, Conn.

December 10, 1940. Hand and Automatic Polishing and Buffing. Albert Rosenthal, Supervisor Polishing, Buffing and Plating, Underwood-Elliott Fisher Company, Hartford, Conn.

December 17, 1940. Cleaning Cycles and Equipment. Thomas H. Chamberlain, Supervisor of Finishing, Chase Brass & Copper Company, Waterbury, Conn.

January 14, 1941. Deposition of Nickel, Dull and Bright. Henry Smith, R. Wallace & Sons, Wallingford, Conn.

January 28, 1941. Deposition of Chromium. Decorative and Hard Chrome. Henry J. Creamer, Winchester Repeating Arms Company, New Haven, Conn.

The balance of the lectures in this course will be conducted on the second and fourth Tuesday of each month up to June 1941.

On Tuesday, December 3, 1940, at the Sterling Chemistry Laboratory of Yale University an open meeting was held. Mr. Leroy Sullivan of the Divine Bros. Company, Utica, New York, gave a very interesting talk on "Polishing Wheels, Their Construction and Use." The process used in making up set-up wheels including the material used in the base of the wheel, the binder used to bond the wheel, and the abrasive used were discussed in detail. Attention was brought to the bacteria which developed in the use of stale or contaminated glues or abrasives and users were cautioned against such contaminations.

On Tuesday, January 7, 1941, at the Sterling Chemistry Laboratory of Yale University, an open meeting was held. At this time, Mr. Donald Wood, Chief Chemist of the Reed & Barton Company, Taunton, Mass., gave a very interesting talk on "Film Exchange." His description and outline of what really happens through the different cycles preparatory to plating revealed a new theory of the actions of the various cleaners, dips, and strikes. It opens a new field for the study of such actions and bring to light the question of the uses of various cleaners and dips.

On Tuesday, February 4, 1941, an open meeting was held at the Sterling Chemistry Laboratory of Yale University at which time Mr. J. Bany of the Electric Products Company of Cleveland, Ohio, gave a very timely lecture on the comparison of motor generator sets with rectifiers as a source of plating current. The comparison covered a full description of both sources of current and cited cases where each source had the advantage over the other. The efficiencies of both sources under no load and full load were shown on graphic slides and the life, maintenance, and overloading of each was brought out.

On February 11 we had a very interesting class session at Sterling Chemistry Laboratory at which time Joseph N. Cooke of the International Silver Company conducted the lecture. The subject was the Electrodeposition of Silver and was ably covered by Mr. Cooke. He cited the several types of silver plating solutions and silver strikes, the processes of making up solutions and the maintenance of the same. The subject of brighteners was thoroughly covered together with the under and over additions of brightener materials. The difficulties encountered with soldered seams and the combinations of various types of base metals in silver plated articles were explained and remedies were given for their troubles.

DOC GARNER, *Secy.*

Here and There

TORONTO-BUFFALO JOINT MEETING

An international joint meeting of the Toronto and Buffalo branches was held at Fox Head Inn, Niagara Falls, Canada, on Saturday, February 8. Mr. John Acheson of Toronto Branch introduced Dr. C. J. Wernlund of Buffalo Branch as chairman of the Educational Session. Mr. F. C. Mesle of Oneida Community was the first speaker introduced. His subject was "Silver Plating to Standard Specifications." Mr. Floyd Oplinger of E. I. duPont Company followed Mr. Mesle, speaking on "Modern Methods of Copper Plating." Bright Nickel plating, with the Hanson-Van Winkle-Munning Cobalt Nickel Process, was the topic chosen by Mr. George B. Hogaboom of the Hanson-Van Winkle-Munning Company. Mr. F. E. P. Griggs, Canadian Hanson-Van Winkle Company, Ltd., spoke on the War Influence on the Cleaning and Plating of Metals.

Although the weather was very stormy, making driving extremely hazardous, there were over 150 present, the majority of these coming from Toronto and other Canadian cities and towns. Despite the weather we never saw a more enthusiastic crowd. The fraternal spirit, always manifested when platers meet, was distinctly noticeable. Many of those attending came from long distances, Ted Eichstaedt coming from Detroit, Phil Lopresti from Rochester (Rochester would have had a larger delegation present but for the poor driving conditions), Ed Rinker from New York, R. S. Leather and Doc Kellner from Waterbury, Conn., and "Cyanide Bill" Schneider, New York.

The banquet at seven was presided over by Mr. Acheson. A toast to the King and Queen was proposed by Mr. Hogaboom. Mr. Acheson responded by proposing a toast to the President of the United States. The National Anthems of both countries were sung followed by the singing of other popular selections, one of which was "There'll Always be an England."

President of the A.E.S. Fred Fulforth gave a brief talk on his recent trip to the Pacific Coast, mentioning particularly his pleasure at being present in Los Angeles when 22 candidates were elected as members of that branch. The Executive Secretary congratulated both the Toronto and Buffalo branches on the fine showing in their first international get-together.

The committees in charge were as follows: For Buffalo: Joe Ruff, president of Buffalo Branch, Dr. Wernlund, W. Fotheringham, L. Nowakowski, Harold A. Day. For Toronto: Archie Smith, president of Toronto Branch, Allen Byers, secretary of Toronto Branch, William Price, John Acheson.

A smoking stand, humidor, and ash tray were donated by the Frederick Gumm Company as door prizes. The Hiram Walker Distillery Company of Toronto presented sound motion pictures of their plant at Peoria, Ill., which is said to be the most modern distillery in the world. This brought the meeting to a close.

We wish to thank President Joe Ruff for the transportation facilities from Buffalo to the Falls. We had an opportunity to discuss the Buffalo Branch on the way. Joe says the branch is in better shape now than ever; he is very optimistic about the future.

Dr. Wernlund, also, used his car to good advantage and is worthy of our appreciation.

Summing up the day's activities, our opinion is that it was very successful. The Educational program was splendid and the various items in connection with the dinner and social were all that could be desired. Let's make it an annual event!

GRAND RAPIDS BRANCH

The Fourth Annual Educational Session and dinner dance of Grand Rapids Branch was held at Hotel Rowe on Saturday, January 18. Approximately 250 were present when Walter Pinner, president of Detroit Branch, was in-

troduced as chairman of the meeting by Maurice Caldwell, president of Grand Rapids Branch. President M. H. Longfield of Chicago Branch was also present. Mr. O. S. True, U. S. Rubber Company, was the first speaker, his subject being "The Uses of Rubber in the Electroplating Industry." He was followed by Mr. W. M. Phillips, General Motors Corporation, who spoke on "Weather as a Corrosion Test." Mr. J. P. Butterfield, American Rolling Mills, chose as his subject "Electropolishing of Metals" and Mr. Paul R. Pine, Harshaw Chemical Company, spoke at length on "The Finishing of Die Castings." All four speakers were listened to with close attention and were heartily applauded at the close of their remarks.

Messrs. Lyman, Sperry, and Maurice Caldwell, were responsible for getting together this fine educational program.

The banquet at seven was attended by 420 persons, and was carried out with as little waste of time and confusion as we have ever seen. Arrangements for the dinner dance and the program which followed were in the hands of Stewart Martin, Chester Smith, who had charge of the ads in the program, Monte Pace, and C. E. Abel, who is secretary of Grand Rapids Branch. The dinner was excellent as was also the floor show. Atomizers were presented to the ladies. The evening's entertainment was followed by dancing to Romanoff's orchestra.

Grand Rapids members are competing with Cleveland in trying to land the 1942 A.E.S. Convention. In this connection may we state that the "furniture city" has plenty of hotel accommodations to house a convention such as ours and has every possible requirement for the display of manufacturers' exhibits.

In addition to this they have a splendid group of men who are willing to undertake the responsibilities necessary to make a successful convention. It is, of course, understood by all branches wishing to entertain the convention from year to year, that the decision as to which city gets the Convention rests with the duly elected delegates.

The passing away of Joseph L. Nook, proprietor of the Kalamazoo Plating Works and a prominent member of Grand Rapids Branch was deeply regretted by all who knew him.

Having attended these events for the last four years, we are amazed at the popularity of the Grand Rapids annual meeting. This branch is constantly increasing its membership and doing bigger things each year. We have only named a few of the active members in this report. It seems as though all sixty members must in some way contribute to the welfare of the branch. More power to you, boys, and thanks for a grand time.

TOLEDO BRANCH

Knowing that we were to visit Grand Rapids, we wrote Mr. Vic Miner, president of Toledo Branch asking him to call a meeting of the officers and committee chairmen for a discussion of some of their branch problems. Those present on Tuesday evening, January 21, at the Hilcrest Hotel were as follows: Vic Miner, Fred May, Walter Weiker, Ward Humlock, Gaston Bergeman, Philip Hale, and Ed. St. Arnaud.

After several hours of earnest deliberation relating wholly to branch affairs, it was found that there was an easy solution to each problem presented. One of the suggestions made at the meeting was that the Ohio branches, Cincinnati, Cleveland, Dayton, and Toledo, hold a regional meeting at some central location in order to get better acquainted with each other and at the same time to advertise the A.E.S., its aims and objects to prospective platers in and around the cities mentioned, who are not now members of the Society.

Mr. Charles Conely, third vice-president of the Supreme Society, has had something of this nature in mind for some time and has promised Mr. Miner to work for its success.

Having been smitten with the "flu" during our stay in Toledo, we were unable to meet the boys in Cincinnati to ask their cooperation. However, we phoned the temporary secretary, Mr. Joe Adler who promised to take the

matter up at the next meeting of the branch. Cincinnati is always eager to do its share in an undertaking such as this so that we may expect their support one hundred percent. Meetings similar to this are being successfully held all over the country and we feel sure that a group such as this or enlarged to include Anderson, Indianapolis, and Pittsburgh, would be of great benefit to all the branches taking part. We are earnestly hoping for a grand rally of the platers in this busy section of the U. S. A.

CHICAGO BRANCH

The Palmer House was again the meeting place of those who attended the 29th annual Educational Session and banquet of Chicago Branch on Saturday, January 25. There was a full attendance at the afternoon meeting including many members and friends from Detroit, Milwaukee, Indianapolis, and other Midwestern cities. There were representatives also from New York, Waterbury, Boston, Springfield, and Bridgeport Branches. The attendance at the banquet was well over 900.

President Longfield introduced Oscar Weickmann as Chairman of the Educational Session assisted by J. W. Hanlon, co-chairman. The following subjects were read and discussed: "Industrial Applications for Gold" Joseph B. Niles, Research and Development Engineer, Thomas J. Dee Company, Chicago, Ill., "A Development in Full Automatic Silver Plating" Frank K. Savage, Research Chemical Engineer, C. G. Conn Ltd., Elkhart, Indiana; "The Value of Lacquer Thickness", R. J. Hazucha, The Clinton Company, Chicago, Ill.; "Generators and Rectifiers" G. J. Berry, Electric Products Company, Cleveland, Ohio.

All four papers were of deep interest and were listened to attentively. The paper on rectifiers by Mr. Berry created considerable discussion owing to the desire for more complete information on the part of platers on this subject. We are hoping to publish both the article by Mr. Berry and the discussion that followed, as well as the papers by Mr. Niles and Mr. Hazucha in a future issue of the REVIEW. The paper by Mr. Savage appears in this issue.

President Fulforth and Past President Goodsell were present; the former was on his way to visit the Pacific Coast branches; the latter never misses an annual meeting of Chicago branch.

Mr. Barron was also present, flying from Boston to declare that this year's convention will surpass anything the A.E.S. has ever seen.

Those of us who arrived early for the meeting wish to thank Frank and Jim Hanlon, and Oscar Servis for their courtesy and hospitality in entertaining us. There was no opportunity to feel lonesome or homesick.

The general committee having charge of the educational session, banquet and entertainment was as follows: H. A. Gilbertson, Chairman, F. J. Hanlon, J. W. Hanlon, J. Hay, R. J. Hazucha, G. Jelinek, C. Kelly, E. A. Lanz, M. H. Longfield, O. E. Servis, O. Weickmann.

BALTIMORE-WASHINGTON ANNUAL MEETING

The above meeting was held at the Colonial Hotel, Washington, on Saturday, February 8, Dr. Abner Brenner presiding. The speakers were Mr. E. J. Roehl, International Nickel Company, Bayonne, New Jersey, subject, "The Adhesion of Nickel Deposits"; Mr. Urban A. Mullin, Wright Aeronautical Corporation, Paterson, New Jersey, subject, "The Use of Electrodeposition in the Airplane Industry"; Mr. E. T. Candee, American Brass Company, Waterbury, Conn., subject, "A Movie on Copper Production from Mine to Consumer, and a description of Plating done by Waterbury Branch"; Mr. D. S. Hartshorn, The Enthone Company, subject, "The Use of Wetting Agents in Cleaning and Plating Solutions."

There was a good attendance at the Educational Session and at the banquet in the evening. We have been informed that the paper presented by Mr. Mullin is a most interesting and instructive one. It will appear in the March issue of the REVIEW.

Dr. Blum entertained the speakers at the Bureau of Standards on Saturday morning previous to the opening of the afternoon session.

Joe Barron was there urging all present to attend the Boston Convention.

Having promised to attend the International Meeting at Niagara Falls on the same day, it was impossible for us to be present at Washington. We hope to visit the branch soon however, to renew acquaintances and to enjoy the beauties of the most interesting city in the world.

BINGHAMTON-SYRACUSE WILL HOLD A BRANCH MEETING IN SYRACUSE MARCH 28, 1941

In an effort to stimulate interest in and around Syracuse, there will be a meeting of the A.E.S. in Syracuse on Friday evening, March 28. This action was taken at a meeting held at Cortland on Friday, January 31. Mr. H. Langenmayer was asked to provide a meeting place in Syracuse. Dr. George Simmons and Mr. F. W. Kenyon, President and Secretary of the Branch were given the job of advertising the meeting with instructions to invite everyone engaged in or interested in plating. The Executive Secretary was asked to provide a speaker for the occasion and to attend the meeting.

Everyone present seemed to be optimistic regarding the success of such a gathering. Rochester Branch we feel sure will cooperate. We believe also that many members of other branches and their friends will help in the success of this attempt to revive interest among the Syracuse platers, job shop owners and industrial concerns not only in Syracuse but in the surrounding cities and towns.

COMING EVENTS

Pittsburgh Branch	March 15
Binghampton-Syracuse Meeting At Syracuse, Friday Evening,	March 28
Milwaukee	April 26
Newark	April 26
New England Regional Meeting At Bridgeport	May 3
Boston Convention	June 9-12

See Historic Boston, Birthplace of American Liberty.

Plan Now to attend the greatest Convention

in A. E. S. History.

June 9 - 10 - 11 - 12, 1941

M. R. THOMPSON

Mr. M. R. Thompson who has been connected for twenty years with the section on electrodeposition at the National Bureau of Standards, has accepted a position with the U. S. Bureau of Mines. He will be located in their electrotechnical laboratory at Norris, Tenn., in charge of investigations on the purification of clays and other minerals by electrophoresis (which in some respects is analogous to rubber deposition).

After graduation from the Massachusetts Institute of Technology, Mr. Thompson was engaged in researches on copper refining in South America and in Baltimore.

The principal subjects of his numerous researches at the Bureau of Standards were nickel plating and cyanide solutions. His paper in 1922 upon the acidity of nickel baths was one of the first in which pH measurements were applied to the plating industry. The use of the high-sulphate nickel bath for plating on zinc is based largely upon his experiments. His work on cyanide baths includes methods of analysis and pH measurements, and also a general summary of the constitution of such baths, which will be presented at the Cleveland meeting of the Electrochemical Society in April, 1941. In connection with his pH studies he developed a new type of glass electrode.

EUGENE PHILLIPS JOINS THE PACKER MACHINE CO.

The Packer Machine Company of Meriden, Conn., manufacturers of Packer-Matic-Automatic Polishing and Buffing Machines, announces the addition to their staff of Eugene Phillips as a Sales and Service Engineer. Mr. Phillips is available to assist his many friends in the trade in their polishing and buffing problems, a business in which he is very well qualified. For the past few years Mr. Phillips was associated with The Puritan Company of Waterbury, Conn., manufacturers of buffing compounds, in the capacity of sales manager.

H-VW-M COMPANY ADDS TO STAFF

The Hanson-Van Winkle-Munning Company, Matawan, N. J., manufacturers of electroplating equipment and supplies, have made a number of additions to their staff. The sharp rise in their business has necessitated increased field representation to provide for the continuance of their customary service.

John E. Keyes, who has been transferred from the Company headquarters in Matawan N. J., has assumed his duties as a representative, located in the Detroit office at 2842 West Grand Blvd. Mr. Keyes brings to the company a long and varied experience in the plating and polishing work in large production plants.

William J. Wise, who was for many years associated with the finishing department of the National Cash Register Company, has joined the Hanson-Van Winkle-Munning sales organization. Mr. Wise has opened a new office located at 601 Oxford Ave., Dayton, Ohio. Mr. Wise is a chemist, a graduate of University of Dayton and has wide experience as an all-around finisher.

W. J. WISE

ROBERT NORTON

Mr. Robert M. Norton, formerly Sales Manager of the Western Union Telegraph Co., in New Jersey and Eastern Pennsylvania has been assigned to work with H. A. Todd, representative of the Company in Syracuse, N. Y., after a period of training in Matawan.

J. MacDonald Smith for many years president of Kabushiki Kaisha A. P. Munning Co. of Kobe, Japan, has returned to the United States. He has rejoined the Hanson-Van Winkle-Munning Company as Export Manager with headquarters at their New York office, 30 Church St. Mr. Smith will also have an office at Matawan, N. J.

O. Waring Mellick, sales representative of the Hanson-Van Winkle-Munning Company has been transferred from their main office, Matawan, N. J., to their Bridgeport, Conn., office at 5th & Charlotte Sts. Mr. Mellick is a grad-

J. MacDONALD SMITH

uate of Yale University, Sheffield Scientific School and before engaging in the plating equipment and supply field was connected with Post and Flagg, New York City.

John VanderVoort has been transferred from the duties of a direct sales representative in up-state New York to special duties in the main office of the Company at Matawan, N. J.

SMITH'S LECTURE AT PHILADELPHIA MEETING

Clarence W. Smith of the Philco Radio and Television Corp., Philadelphia, Pa., covered his subject: "Recent Developments in Bright Zinc Plating" extraordinarily well. Everyone present was pleased with his style and manner of presentation. Without a doubt bright zinc plating is something with which Smith has had a long practical experience.

Composition of the bath:-	oz./gal.		oz./gal.
Zinc sodium cyanide	10	Sodium thiosulphate	0.5-0.75
Ground sodium cyanide	8.3	Sodium sulphide	0.066
Sodium hydroxide	10	Molybdenum oxide (brightener)	1.5

Temp. 105° F, C. D. 70-75 amp./ft.^{2}, cathode eff. 80%, anode eff. 100%. Thickness of deposit 0.0003 inches in five minutes.

The zinc plated fabricated steel parts are **bright dipped,** after a cold water rinse, in a solution of four gallons of concentrated nitric acid and seven hundred gallons of water. The thickness of the zinc coating is reduced 0.000015 inches by the bright dipping operation.

Preparation of the steel parts for zinc plating:

1. Spray wash containing 1 oz./gal. of a commercial cleaner.
2. Electro-clean (anodic) 1.25 minutes, 190°F.
3. Warm water rinse.
4. Pickle sulphuric acid 8-10%. Inhibitor acitrol #1, temp. 130°F.
5. Cold water rinse (spray).

—From the *Philadelphia Reminder.*

TIME SAVING COMPOUND IS DEVELOPED BY FORMAX

Formax Manufacturing Company of Detroit has just brought out a product for reconditioning and refinishing all types of automobile surfaces and finishes. 4-MAX All-Purpose Rubbing Compound combines four distinct operations in one. It cleans, rubs down, polishes and waxes the finest enamel and lacquer finishes (or synthetic lacquers and enamels) without danger of scratching, roughing or marking.

It cuts through lacquer oxidation, scum, road film, alcohol stains, road tar and dead paint pigment. Extra soft abrasive is used in 4-MAX Compound, insuring the most delicate under-finishes against gouging or marring. Its waxing property means a saving in time and energy.

In spot refinishing and touch-up work demanding perfectly blended feather edging, its smooth, positive action blends repaired spots into the surrounding finish with uniformity and ease.

A sample of 4-MAX Hand Rubbing Compound is available by writing Formax Manufacturing Company, Detroit, Michigan.

DEATH OF CLAUDE S. TOMPKINS

Mr. Claude S. Tompkins died at his home at 7020 S. Jeffery Ave., Chicago, Ill., on Jan. 12, 1941. He had been ill for almost eight weeks. He is survived by his wife Anna and his brother Charles.

Mr. Tompkins was an Industrial Representative of the J. B. Ford Sales Company for 23 years. He originally joined the Society in Detroit of which branch he was one of the founders. He joined the Chicago branch when he was transferred there in 1927. He was one of the first industrial men in the company's employ and pioneered many innovations in metal cleaning and cleaners. He has published several articles on metal cleaning and cognate subjects.

Mr. Tompkins belonged to many organizations connected with the metal industries and several fraternal societies including the Shriners.

Services were held both in Chicago and Gobler, Michigan, where he is now at rest not far from the place of his birth. Due to his considerable travels while representing the J. B. Ford Sales Co. he had a very wide circle of friends in the plating industry. He will be missed by his many friends as he was ever ready to offer a truly helpful hand.

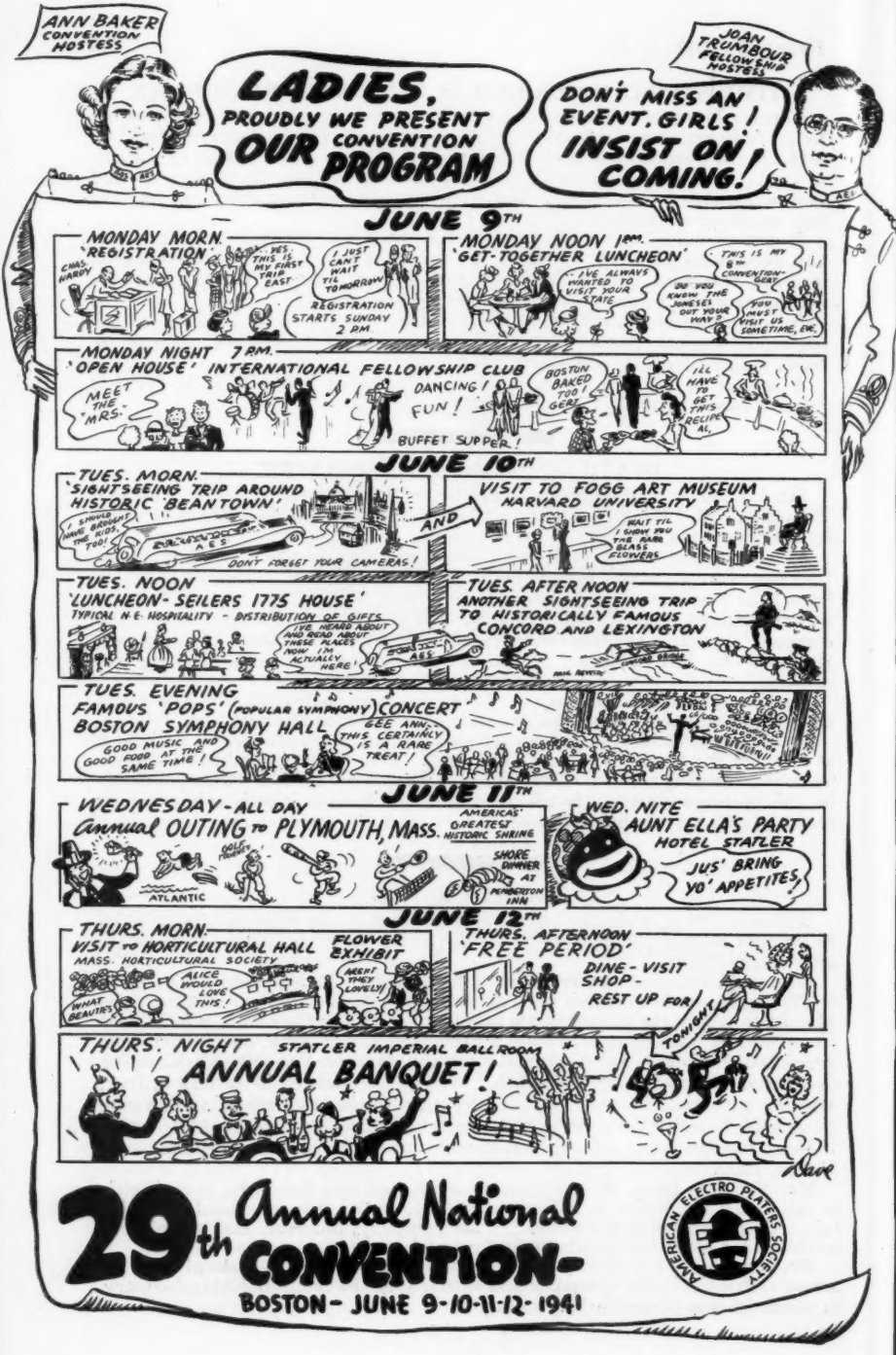
WARREN L. NEU

Warren L. Neu, a former official and director of the Hanson-Van Winkle-Munning Company, Matawan, N. J., died at his home on Friday, January 10, after a long illness.

Warren L. Neu first entered the employ of the A. P. Munning & Company in 1919, as a member of their sales department, later becoming Assistant Sales Manager. After the merger of this company with the Hanson & Van Winkle Company, he was engaged in special sales department work, and in 1930 was appointed Assistant Sales Manager of the Hanson-Van Winkle-Munning Company. During a part of 1932 and 1933 he was located in Anderson, Ind., working with that branch, and then returned to the home office in Matawan, N. J. On March third, 1931, he was elected a director and on March 6th, 1934, a vice-president of the company, continuing in that capacity until March, 1939.

Mr. Neu was taken ill in February, 1937, and was forced by poor health to relinquish his duties as a director in July, 1938. He continued to maintain a deep interest in the welfare of the company, however, and was always available for his valuable advice and counsel.

Mr. Neu leaves a widow, Mrs. Amy Baier Neu. His loss is deeply felt by a host of friends in the company and throughout the metal finishing industry in which he was always a helpful factor.


ANN BAKER
CONVENTION HOSTESS
LADIES,
PROUDLY WE PRESENT
OUR CONVENTION
PROGRAM
JOAN TRUMBOUR
FELLOWSHIP HOSTESS
DON'T MISS AN EVENT, GIRLS!
INSIST ON COMING!
JUNE 9TH
MONDAY MORN.
'REGISTRATION'
CHAS. HARDY
YES, THIS IS MY FIRST TRIP EAST
I JUST CAN'T WAIT TIL TOMORROW
REGISTRATION STARTS SUNDAY 2 PM
MONDAY NOON 1PM.
'GET-TOGETHER LUNCHEON'
I'VE ALWAYS WANTED TO VISIT YOUR STATE
THIS IS MY 8TH CONVENTION-GERY
DO YOU KNOW THE JONESES OUT YOUR WAY?
YOU MUST VISIT US SOMETIME, EH.
MONDAY NIGHT 7PM.
'OPEN HOUSE' INTERNATIONAL FELLOWSHIP CLUB
MEET THE 'MRS.'
DANCING!
FUN!
BUFFET SUPPER!
BOSTON BAKED TOO! GEE!
I'LL HAVE TO GET THIS RECIPE AL
JUNE 10TH
TUES. MORN.
'SIGHTSEEING TRIP AROUND HISTORIC 'BEANTOWN'
I SHOULD HAVE BROUGHT THE KIDS TOO!
DON'T FORGET YOUR CAMERAS!
AND
VISIT TO FOGG ART MUSEUM
HARVARD UNIVERSITY
WAIT TIL I SHOW YOU THE RARE GLASS FLOWERS
TUES. NOON
'LUNCHEON- SEILERS 1775 HOUSE'
TYPICAL N.E. HOSPITALITY - DISTRIBUTION OF GIFTS
WE HEARD ABOUT AND READ ABOUT THESE PLACES NOW I'M ACTUALLY HERE!
TUES. AFTER NOON
ANOTHER SIGHTSEEING TRIP TO HISTORICALLY FAMOUS CONCORD AND LEXINGTON
TUES. EVENING
FAMOUS 'POPS' (POPULAR SYMPHONY) CONCERT
BOSTON SYMPHONY HALL
GOOD MUSIC AND GOOD FOOD AT THE SAME TIME!
SEE ANN, THIS CERTAINLY IS A RARE TREAT!
JUNE 11TH
WEDNESDAY - ALL DAY
Annual OUTING TO PLYMOUTH, MASS.
AMERICAS' GREATEST HISTORIC SHRINE
ATLANTIC
SHORE DINNER AT PEMBERTON INN
WED. NITE
AUNT ELLA'S PARTY
HOTEL STATLER
JUS' BRING YO' APPETITES!
JUNE 12TH
THURS. MORN.
VISIT TO HORTICULTURAL HALL
MASS. HORTICULTURAL SOCIETY
FLOWER EXHIBIT
ALICE WOULD LOVE THIS!
AREN'T THEY LOVELY!
WHAT BEAUTIES!
THURS. AFTERNOON
'FREE PERIOD'
DINE - VISIT SHOP - REST UP FOR
TONIGHT
THURS. NIGHT
STATLER IMPERIAL BALL ROOM
ANNUAL BANQUET!
Dave
29th Annual National CONVENTION-
BOSTON - JUNE 9-10-11-12- 1941
AMERICAN ELECTRO PLATERS SOCIETY

An Invitation to the Ladies . . From the National Convention Hostess.

You ladies it seems are becoming increasingly important, and today not only do you pick out hubbies' neckties, but their automobiles as well. Smart designers and style leaders in every line recognize the fact that today the ladies control the purse strings in the household.

The American Electroplaters' Society fully realizes that at the past Annual Conventions, your presence has added the color needed to make any National Convention a success.

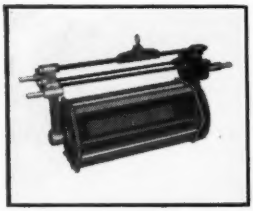
As the National Convention hostess, I wish to extend to every lady an invitation to this the 29th National Convention, to be held in Boston, Mass., June 9-10-11-12, 1941.

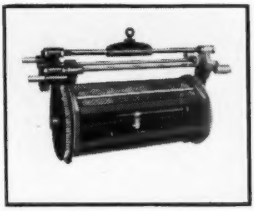
A program has been arranged, especially for the ladies, which will (they tell me) be the best one ever attempted by any Ladies' Convention Committee.

The pages of American history will be turned back by the many historic shrines that will be visited. A great day at America's great historic Plymouth, that shore dinner at Pemberton Inn, Boston's famous "Pops Symphony Concert," the International Fellowship Open House and the Gala Banquet at the Statler's beautiful Imperial Ballroom.

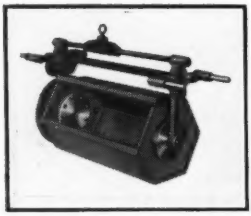
Insist on coming. Make plans now with hubby to accompany him to the greatest Convention ever held in the Society's history. A good time you will never forget. See you all in June. . . . .

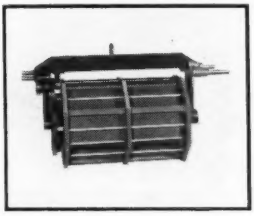
ANN BAKER
National Convention Hostess





Top left: **standard bakelite plating cylinder, size 14″ x 30″, showing triple tie rod hangers and outboard support bearing on the pinion shaft.**

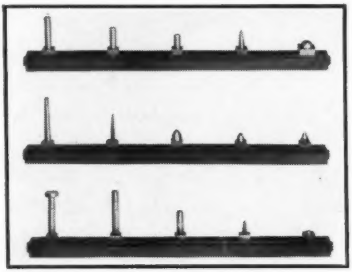




Top right: **hard rubber cylinder, size 14″ x 30″, showing "T" type contact.**

Lower left: **monel pickling cylinder, size 16″ x 30″.**

Lower right: **two-compartment cylinder, size 20″ x 30″, showing pinion shaft support bearing.**



At left: **types of rib contacts available on H-VW-M plating cylinders.**

All H-VW-M Mercil Type barrel plating cylinders are rugged and simple. A wide versatility of design is available in a broad range of materials developed to give proper construction to meet different purposes. A greater variety of work can also be barrel plated because of the perfection of the various types of rib contacts as shown. Other contacts are available in the dangler, cone, disc and "T" types.

Manufacturers of a complete line of electroplating and polishing equipment and supplies

HANSON-VAN WINKLE-MUNNING CO.

MATAWAN, NEW JERSEY

9H

9H

9H

SOFT
SEMI
BRIGHT
NICKEL

This Cobalt Nickel Process is rapidly growing in popularity. It ranges from semi-bright to bright deposits, has remarkable ductility with low-cost operation and simplicity of control. If you have not investigated the 9H Cobalt Nickel Process our representative will gladly supply details.

PLANTS: . . Matawan, New Jersey . . Anderson, Indiana . . Bridgeport, Connecticut
SALES OFFICES: Anderson · Bridgeport · Chicago · Cleveland · Dayton · Detroit · Elkhart · Matawan
Milwaukee · New Haven · New York · Philadelphia · Pittsburgh · Springfield (Mass.) · Syracuse

Business and Social News

BRANCH NEWS

Educational Activities

AMERICAN ELECTROPLATERS' SOCIETY

Hartford Branch held its January meeting at the Hartford Electric Light Company's room at 294 Pearl Street, Hartford, Conn., January 20. The speaker for the evening was Mr. O. V. Simonson from the Milligan & Higgins Glue Company. Apparently the use of glue dates back at least to the Egyptian mummies. The manufacture of glue was very clearly described, from the selection of the right type of skins to the finished material, and the changes that have taken place from the old methods especially concentrating the glue liquor to speed up the process.

There was quite a discussion regarding the relative merits of hide glue and the new cold cements. Tests run by the abrasive people showed more passes for each set up wheel and more metal removed than by the new cold cements.

We received a new application from Edwin Crandall of Landers, Frary & Clark Company of New Britain, Conn. Five new members were elected into our membership.

APLEY N. AUSTIN, *Secy.*

New Haven Branch. Lecture Number 4 in the course in Practical Electroplating, which is being conducted by the New Haven Branch, was held on Tuesday, December 17, at the Sterling Chem. Lab. of Yale University. Doc Garner of the International Silver Company read the paper of Tom Chamberlain of the Chase Brass & Copper Company, who was unable to be present, the title of which was "Cleaning Cycles and Equipment." This paper included a description of the various types of cleaning prior to electroplating, along with a discussion of the advantages and disadvantages of each type. Some of the types of cleaning discussed are hand cleaning, mechanical cleaning, electro-cleaning (cathodically and anodically), pressure spray cleaning, and degreasing. A lengthy question and answer period took place, during which many interesting subjects were brought up.

Lecture Number 5 was held Tuesday, January 14, 1941 at the same place. The speaker on this occasion was Mr. Henry Smith of R. Wallace & Sons, Wallingford, Conn., who had for his topic "The Deposition of Nickel." Mr. Smith included both dull and bright nickel plating in this lecture. The following matters were taken up: different types of anodes, different salts and their purposes in the nickel bath, causes of pitting, including low nickel concentration, occluded hydrogen and oxygen, dirty solutions, presence of organic matter, etc., along with different methods of eliminating them, different kinds of bright nickel plating. Mr. Smith's talk provoked many interesting questions.

The next lecture in this course will be held on Tuesday, January 28, and the subject of the lecture will be "The Deposition of Chromium."

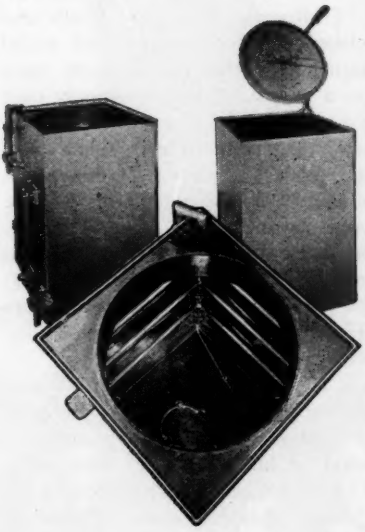
The next open meeting of the New Haven Branch will be on Tuesday, February 4, when Mr. Gordon J. Berry of Electric Products Company, Cleveland, Ohio, will talk on "Generators and Rectifiers."

JOSEPH T. SULLIVAN, *Vice-pres.*

Vortexeddy

THE STORTS WAY of RINSING WITH SPRAY

MAKES EVERY DAY A COST-CUTTING PAY-DAY



YOUR NEAREST UDYLITE OFFICE WILL GLADLY AND PROMPTLY SERVE YOU

THE UDYLITE CORP., DETROIT, MICH.
The Udylite Corp., Chicago, Ill.
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The Udylite Corp., Cleveland, Ohio
J. C. Miller Co., Grand Rapids, Mich.
Donald Sales & Mfg. Co., Milwaukee, Wis.
L. H. Butcher Co., San Francisco, Cal.
L. H. Butcher Co., Los Angeles, Cal.
MacDermid Inc., Waterbury, Conn.
Electroplating, Inc., Atlanta, Ga.
F. H. Bathke, St. Paul, Minn.

The No Obligation Booklet Telling Why, Is Yours For the Asking—Write For It WITHOUT DELAY TODAY

STORTS WELDING COMPANY

42 STONE STREET MERIDEN, CONNECTICUT

Manufacturers of Welded Fabrications to Specification

Buffalo Branch held its regular monthly meeting at the Bailey Bowling Academy, Friday, January 10. Arrangements for the joint educational session with Toronto were discussed. The reputation and caliber of the speakers for this event is so well known that a large attendance is naturally expected.

The meeting was jointly divided between Dr. C. J. Wernlund and Mr. J. T. Rooney who gave a practical demonstration of copper and nickel plating. The copper cyanide bath was a simple solution commonly used as a copper strike or as a base plate on steel preparatory to acid copper plating. Wide latitude was permissible in its composition varying from 2-8 ozs. copper cyanide and from 2-10 ozs. sodium cyanide. The best results were obtained with a ratio of 2 to 2½. The excellent throwing power of this solution was demonstrated on deeply recessed steel parts.

A 1% cobalt nickel solution was demonstrated by Mr. J. T. Rooney. For optimum results this solution should be kept at 140°F. with a pH of 3.6 to 3.8 and a current density of 25 A.S.F. should be used. Filtration was necessary as impurities were harmful and undesirable. Cobalt sulphate was added to maintain solution strength and to increase ductility. Brightness at low concentration and a very ductile plate with the addition of cobalt sulphate were shown in sample pieces.

A wide range of questions was answered by the speakers and as the preparation and actual plating had been done in full view of the audience the meeting was greatly enjoyed by the platers present.

RODERICK MCGHEE, *Secy.*

Boston Branch met Thursday January 9 at the Statler Hotel, Boston, with President Jones in the chair and all officers present.

Joe Barron made his report as one of progress. Arthur Mintie chairman of the exhibits reports that he has sent out letters with instructions as to how each branch should handle the exhibits and hopes that every branch will reply and have an exhibit at the Boston convention. One application was read for the first time and turned over to the board of managers, Willard P. Durgin, 340 Meridian St., E. Boston, Mass.

The transfer of Harold Narcus from Providence to Boston branch was approved.

There was some discussion on how to treat Nickel itch by Bert Sage and Harry Lack told how to prevent it by using tallow, rubbing it on the arms.

EXPERIENCED ELECTROPLATERS
prefer
ANACONDA
Copper Anodes

... because their unexcelled purity assures uniform corrosion, the highest quality deposit in the shortest possible time and low scrap losses. Furnished with suspension holes drilled as desired, or tapped for end hooks.

THE AMERICAN BRASS CO.
General Offices, Waterbury, Conn.
Offices and Agencies in Principal Cities

This will prevent the solution from getting on the skin.

Our Librarian Arthur Collins introduced the first vice-president Ellsworth Candee as speaker of the evening. Subject was "From Mine to Consumer." He showed a complete picture of the copper and copper alloy industry from the ore to the rolling of the copper and the finished product. He also spoke of the way they do plating there. He answered all questions and there were plenty even after the meeting.

A. W. GARRETT, *Secy.*

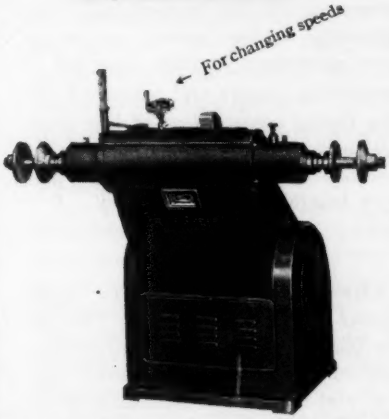
Anderson Branch held its January dinner meeting on Tuesday, January 7, at the Y.M.C.A.

Mr. Ralph E. Pettit of the Aluminum Company of America spoke on "Aluminum and Its Finishes." The chapter also had as its guest Mr. Douglas Page of the Aluminum Company's Chicago office who, with Mr. Pettit, contributed to an informal discussion following the business meeting. Mr. Pettit's interesting summary of the problems and efforts expended in an attempt to obtain cheap aluminum was supplemented by sound movies, a series of slides, and an especially elaborate exhibit which showed the application of aluminum both for direct use and as a base for ornamental finishes.

Anderson Branch was fortunate in obtaining the services of Mr. George W. Onksen, of Guide Lamp Div., G. M.C., as chairman of its plating exhibit committee for the coming convention. Since Mr. Onksen has attended several previous conventions and was practically solely responsible for the branch's exhibit at Asbury Park, the chapter very enthusiastically seconded his appointment by the vice-

HAMMOND of KALAMAZOO

RITE-SPEED POLISHERS



Single or Variable Speeds – 1 to 50 H.P.
A Model for Every Application.

HAMMOND AUTOMATICS
(Rotary and Stralt Line)

High Production and High Quality Finish, Polishing or Buffing, are possible on HAMMOND Automatics. We build a complete line. Send samples for prices and approximate production figures.

Hammond Machinery Builders INCORPORATED
KALAMAZOO, MICHIGAN, U.S.A.

Eastern Branch — 71 W. 23rd St., N.Y.C.

president presiding, Mr. Mark Monroe Trook.

The chapter reaffirmed its stand in favor of preprints of the papers to be presented at the convention. The delegates to the recent convention were unanimous in their approval of preprinting papers and expressed the idea that a continuation of this practice in the Boston and in future conventions would make for better and more helpful discussion periods.

REX W. OYLER, *Secy.*

Chicago Branch held its 345th regular meeting January 11, 1941 at the Atlantic Hotel—All officers present. Application of A. L. Pietrowicz was read and referred to committee of J. Hay, C. Kelly, and H. A. Gilbertson.

Letter from W. J. R. Kennedy stated that any member can have ¼ page in the REVIEW to advertise for a job, or any firm desiring to hire a plater or polisher foreman. Letter from P. R. Lyons, president of Cleveland branch, asked for support for Cleveland as 1942 convention city.

"The Effect of Speed in the Design of Polishing and Buffing Lathes" was a talk given by our Mr. Harold W. Faint, of the Hammond Machinery Builders, Inc., Kalamazoo, Mich. He brought out the reasons why lathes should be adapted to local conditions and the job desired to be accomplished.

The following were in the question box:

Q. Can two chrome tanks be run from one generator without too much expense?

A. More satisfactory to use separate generators, unless only small current necessary, account loss of power through rheostats.

Q. What causes nickel to crack or blister on cold rolled steel? pH 6.0, 3.5 nickel metal, chlorides 3 oz., boric acid 3 oz.

A. Consensus of opinion was improper cleaning.

Q. Can hard chrome be deposited inside of a hole, .005 in. diameter, through metal $\frac{1}{64}$" thick?

A. Does not seem practical.

Q. Desire brightener for room temperature cyanide copper solution, other than hypo.

A. Lead is touchy. Believe best to use lower metal content, with higher cyanide, being careful of excess cyanide.

Q. What is easiest method of removing excess zinc cyanide from bronze solution?

A. Sodium sulfide, then remove precipitate. Suggest working out the zinc by warming solution till bronze color obtained, adding only copper until bronze color is obtained at the temperature desired to be used.

E. A. LANZ, *Secy.*

YOU SHOULD USE

Zialite

Reg. U.S. Pat. Off.

Nickel Plating Solution

1. If you plate ZINC or ALUMINUM DIE CASTINGS.
2. If you wish to cover complicated shapes.
3. If you plate articles made of several pieces soldered together and want to cover the solder.

ONE bath for ALL types of WORK or METALS

STAN-O-LEAD

A new bath plating a tin-lead alloy.
Corrosion resistant.
Ideal for parts which must be soldered.
100% current efficiency.

ZIALITE CORPORATION
143 Exchange Street
WORCESTER, MASS.

Cleveland Branch. The regular meeting was called to order at 8:30 P.M. by President R. Lyons at Hotel Cleveland.

The following were elected to active membership by a unanimous vote: Mr. George Winterstein of The Electroplating Works, Mr. John Hallack, Mr. William Herbert, Mr. William Henry, Mr. Melvin E. Weaver of The Advance Plating Company. The following names were received for applications: Mr. J. L. Stonebrenner and Mr. George P. Kregelius, for associate membership, and Phillip Brotzman, for active membership.

Mr. Singler our Entertainment Chairman is to promote a Dinner Dance to be held February 22 at the Hotel Cleveland.

Our Librarian, Mr. John Honnecker, presented Mr. F. C. Mesle of Oneida, Limited, Oneida, New York. Mr. Mesle gave a talk on "Evaluating Electroplating and Plating Methods." He illustrated his talk by the use of slides and also by a large number of samples of work in silver plating.

Mr. Mesle displayed two very interesting tools, one for holding a file to make measurements by the cord method together with a chart that made measurements very simple. He also showed a tool for measuring the pull of plate and thereby giving a check on adhesion.

FRANK J. OPATRNY, *Secy.*

Indianapolis Branch. The December meeting was called to order by the president, Mr. W. R. Binai, who immediately transferred it to Mr. R. J. Hennessy, the vice-president, with the suggestion that the duties of the meeting chairman be shared equally by Mr. Hennessy and himself.

Dr. Frank C. Mathers, head of the Chemistry Department of Indiana University and an enthusiastic worker in the field of electroplating, was then introduced by Mr. Hennessy. Dr. Mathers gave as his subject for the evening "Addition Agents in Plating Solutions."

The speaker confined his remarks to addition agents in acid baths only and he distributed numerous actual samples for inspection during his discussion. The general belief at the present time, according to Dr. Mathers, in regard to the brightening action of addition agents is that an agent, such as glue, forms an insulation over the more protruding crystals on the plated piece, therefore giving the surrounding area an opportunity to build up to the size of the insulated one. The theory which Dr. Mathers advanced was that

In 1941 — we have the answers!

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an agent of this sort was useless without its combination with the complex ions in the solution especially about the cathode. His samples showed his good fortune in different baths with some of the following addition agents: glue, peptone, cresol, lead sulphamate, and clove oil. Dr. Mathers emphasized the point that different baths must have different addition agents. He said that a good plate is a function of all the constituents of a bath which happen to be at the cathode face; the percentages of light and heavy water may effect the ionization to such an extent as to produce either a good or a bad deposit. LELAND E. BASS, *Secy.*

Lancaster Branch. At the December meeting, Dr. Sanigar gave the first part of a very fine lecture. He plans to continue it at our March meeting at York.

Mr. N. J. Gebert, our vice-president, was elected president and Mr. C. E. Brubaker was elected to serve as vice-president for the remainder of this season. Mr. Critchfield plans to retain his membership with us for the present.

Lancaster Branch was indeed fortunate to have as its speaker for our January meeting George B. Hogaboom, Sr. The meeting was designated as "Problem Night" and after listening to our speaker we all realized just how little we know about electroplating.

George outlined the organization and development of the American Electroplaters' Society and the part which this group has played in the promotion of electroplating. The important part which electroplating is playing in the industrial development was outlined and outstanding developments were cited. The speaker outlined the development of the plating of Nickel, Copper, Zinc, Tin and Silver and their applications were also listed both from the past uses and future prospects.

Various factors controlling plating from solutions, such as polarity, throwing power, deposition, resistivity and other items were discussed and the relative importance of each listed.

Following this basic data and outline the meeting was then conducted as "Problem Night" at which time numerous questions were discussed and some very helpful advice was given by the speaker.

Some of the items discussed were:

Q. What concentration of carbonates

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is considered detrimental in cyanide solutions and what is the recommended method for removing?

A. 8 oz. gal. is the maximum concentration for carbonates. Above this excessive gassing occurs at the cathode. Crystal and coarse deposits also are plated out. The recommended and proven method for removal is freezing and this is extensively used.

Q. Can insoluble anodes be used in acid zinc solutions?

A. Insoluble anodes are only applicable in cyanide zinc baths. In acid solutions excessive gassing occurs. The use of soluble vs. insoluble anodes was discussed for various solutions.

The next scheduled meeting will take place on February 14 at which time Mr. F. Oplinger of E. I. duPont will speak on the subject of "Bright Copper."

A "Plant Visitation" will be held at C. E. Brubaker plating plant following the meeting. H. L. HOVIS, *Secy.*

Los Angeles Branch. At the Rosslyn Hotel, after a dinner at which almost thirty prospective members were guests of the branch, President Bedwell called the meeting to order.

Mr. Rushton, chairman of the evening, explained to our guests the purposes and aims of the Society and told of the cooperation among platers, that was so conspicuous by its absence before the Society was founded. Several of the Charter Members of the Branch who we were afraid had completely forgotten Los Angeles Branch were present and were introduced.

Bruno Schindler gave a talk on "Oxidized Finishes." He explained how they were produced and how a set of standard finishes is finally adopted which should make the life of all platers pleasanter and longer.

E. R. Holman spoke on "Anodizing Aluminum." As there are many airplane factories here the members found this talk very timely, as this process is finding extensive application in the aircraft industry.

A moving picture on the production of steel was shown through the courtesy of ARMCO Steel.

A special meeting was held January 29 at the Rosslyn Hotel when President

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Fulforth addressed the members.

ERVIN FRAUENHOFF, *Secy.*

Milwaukee Branch. On January 3, Mr. John Bogle of the Udylite Corporation, Detroit, Michigan, addressed the Branch on "Rectifiers and their use in the plating room."

He dispelled many of the misconceptions that have been prevalent regarding rectifiers, and described in detail the proper application of these devices, and particularly stressed the fact that in some cases the rectifier can be used to advantage, and that in others the generator was and is still the proper source of low voltage direct current. Generally, rectifiers are not a substitute for generators, but rather serve as a much needed supplement to the plant's present generating equipment when the sudden need for more amperes appears. Mr. Bogle pointed out that in the great majority of cases when that need appears, a rearrangement of the present connections to the generators can usually be effected, and a rectifier of the proper size attached to one or two tanks; for example, the cleaners or barrels, and the generator surplus thus created may be utilized in the plating tanks. This arrangement avoids the necessity of trading in otherwise good generators at a small fraction of their actual worth, and waiting for weeks or months for a new generator.

Mr. Bogle also showed that while many people have had the idea that rectifiers are not as efficient as generators, this is not the case. While it is true, he said, that considering the generator alone, and the rectifier alone, the generator is more efficient (electrically), when one considers that usually there are high losses in long runs of bus, this is not the case in the use of a rectifier. They can be placed very close to the point of use of the current, thus cutting down the bus to a minimum, and also the losses in bus, which are much greater than most people realize. He insists that when one considers all of the costs involved in the two sources of current, one will find that the cost per ampere *delivered to the tanks* will be about the same with rectifiers as with generators.

Mr. Charles H. Stoddard was initiated as an associate member of Milwaukee Branch.

Milwaukee voted to have a picnic on or about the last Sunday in July.

DEXTER F. RHODES, *Secy.*

Providence-Attleboro Branch. The regular meeting was held January 20 at the Rhode Island School of Design following a dinner at the Narragansett Hotel. The speaker of the evening was Dr. C. B. F. Young who spoke on "The Removal of Carbonates from Cyanide Solutions." Dr. Young discussed the various methods, their advantages and disadvantages, and presented considerable laboratory data on

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the method of using Barium Cyanide.

A short business meeting was held later. An expression of sympathy was voted for the accidental death by cyanide poisoning of one of our members, James Lennox. It is alleged that he was breaking cyanide with a wrench when a piece flew into his mouth. Thinking he had washed it out he returned to work where he died suddenly. This unfortunate accident may serve as a warning to any who have grown careless in handling this chemical in their plating rooms.

ROBERT D. MACLACHLAN, *Secy.*

Toledo Branch held its regular meeting in the laboratory of the Macomber High School in Toledo, Ohio, December 5. 20 members and 10 visitors were present.

Prior to the business meeting, we had the pleasure of seeing a very interesting moving picture, in color, entitled "A New World through Chemistry," brought to us by the duPont Company.

The meeting was then called to order by the president, Mr. Miner. A letter from the executive board, concerning preprints of papers for the convention was read and acted upon. The branch voted in favor of the preprints and made the suggestion that they be sent out two weeks prior to the convention so that persons interested would have a chance to read them before they are read at the convention, thereby encouraging better discussions on such papers at the educational sessions. However, given the choice between the preprints and the convention proceedings, the vote was unanimous for the proceedings. Mr. Shank requested that his resignation as chairman of the membership committee be considered at this time, so as to make room for someone who could devote more time to the job. But in light of all the good work already done by him, and at the specific request of many members, the chair refused to accept his resignation. So Mr. Shank promised to continue in the capacity of chairman, provided that every member would give the committee his full support and consider himself a committee of one to assume the responsibility of getting at least one new member during the year.

The secretary was instructed to send a letter to Mr. Hunlock and request him to serve as a member of the research committee in the capacity of a chemist and technical adviser.

Mr. Hunlock was also appointed chairman of the exhibits committee with instructions to see to it that Toledo will be well represented at the Boston Convention.

Mr. Hale was appointed chairman of the paper committee, other members on this committee are Messrs. Paul Dressel, Harry Moser, David Williamson, and Ward Hunlock. It will be the duty of this committee to write up a branch paper for the 1941 convention in June.

Mr. Benner, of the duPont Company was introduced by Mr. May. Mr. Benner talked on new developments in

copper plating. The talk was very educational and was well received by everyone present. Mr. Benner answered many questions.

G. H. BERGEMAN, *Secy.*

Cleveland Branch held its regular meeting at Hotel Cleveland. The meeting was called to order at 8:30 P.M. by President R. Lyons.

The application of Frank Roy of 4480 Clague Road, Olmstead Falls, Ohio, employed at the American Steel & Wire Company was turned over to the board of Managers for approval.

Mr. Singler reported progress on the Washington's Birthday party at Hotel Cleveland, Saturday evening, February 22. He promised a good time for all and perhaps a surprise. A communication was read from Mr. Roderick M. McGhee of the Buffalo Branch promising their support in Cleveland's bid for the 1942 Convention. A report was then given by the secretary on the last Harvest Party.

Our President R. Lyons then recognized some of our members that had not been attending regularly and called on some for remarks, such as Messrs. Nachtman, Thompson, and Hull. Mr. Hull then brought up the subject of the objections of some of the members not being able to attend on account of the Saturday meetings.

Mr. John Honnecker then introduced the speaker of the evening, Mr. W. M. Phillips, head of the Electro Chemistry Department of General Motors Corporation of Detroit, Michigan. Mr. Phillips illustrated his talk on "Plated Automotive Parts for Their Durability in Service" by the use of an opaque projector. Mr. Phillips stressed the progress that has been made from 1935 up to the present time in the improved quality of work. This he substantiated by figures and records of tests in a large number of states and cities.

FRANK J. OPATRNY, *Secy.*

Newark Branch held its regular meeting Friday evening, January 17 at Hotel Douglas, Newark, N. J. The meeting was called to order at 8:30 P.M. with President William T. Maguire presiding. A communication from Cleveland Branch with reference to the 1942 Convention was turned over to the delegates to the Boston Convention.

The secretary reported that he had received an official invitation to New-

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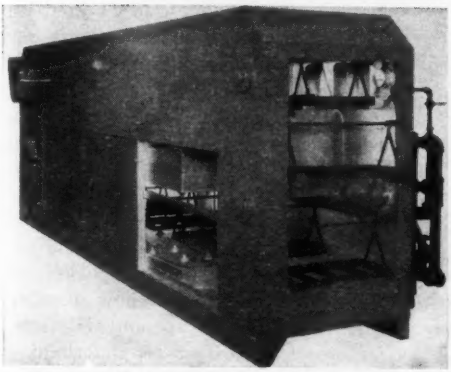

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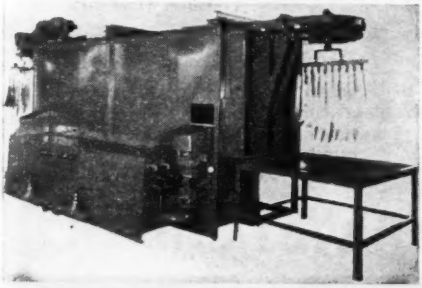

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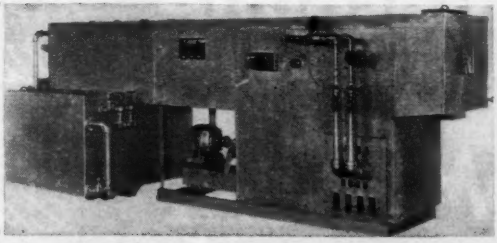

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ark Branch to attend the New York Branch Banquet on February 22 at the Hotel Pennsylvania, New York City. The Guest of Honor at the banquet will be the founder of the Society, Charles H. Proctor who will be 75 years of age around that date.

The following applications were voted to take the regular course: Joseph W. Frasano, Curtiss Propellor Division, associate membership; Victor Trovato, Wright Aeronautical Corporation, associate membership; John Miller, Harry C. Schick Company, active membership; John W. Varick, Matchless Metal Polish Company, associate membership. Mr. Floyd M. Erlenmeyer's request for a resignation was granted.

Mr. Horace Smith next made the final report on the Christmas Party and suggested that the Christmas Party next year be held in a larger hall. It was voted that the committee engage the Irvington Moose Club Hall for the 1941 Christmas Party.

Mr. Paul Oldam, Chairman for Newark Branch's convention exhibit asked all the members to get started on some article as soon as possible in order to give him time to design the exhibit panel.

Our Librarian, Mr. Louis Donroe brought up the question of how we could get a larger attendance at our meetings. It was suggested that letters should be sent to all the manufacturers, in Union, Essex and Hudson Counties, who are interested in electroplating. Mr. Robert Sizelove promised to secure a list and Mr. Donroe to send out the letters.

Mr. Robert Sizelove, acting librarian, next presented the Guest Speaker for the evening, our own fellow member Mr. G. Byron Hogaboom. His subject was "Simple Tests for Determining Thicknesses of Copper, Nickel, Tin, Zinc and Cadmium." Byron gave us a very good talk on this subject and promised to re-write it for publication in the MONTHLY REVIEW.

GEORGE WAGNER, *Secy.*

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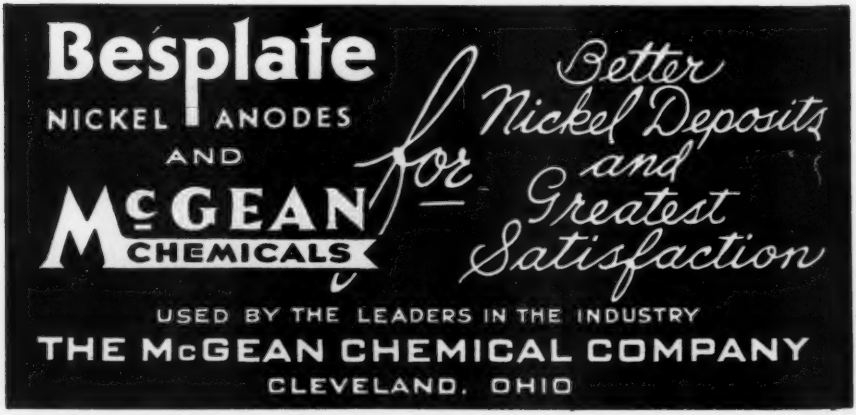

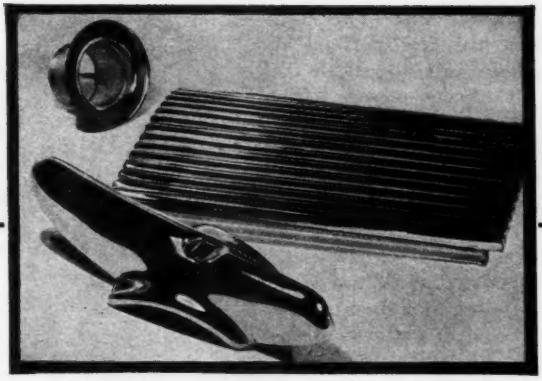

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Boston Branch met Thursday, February 6 at the Statler Hotel at 8 P. M. with President Jones in the chair and all officers present. One application was read and approved by the Board of managers and elected to associate membership: Willard P. Durgin, 340 Meridian St., East Boston, Mass.

Boston branch voted to send out letters to all the manufacturers in metropolitan Boston to bring in all the platers that should be members of the A.E.S.

Our Librarian Arthur Collins introduced, as the speaker, Nathan E. Promisel. The subject of his talk was "Silver Plating." He wrote the formulas of the following silver solutions on the board: Potassium cyanide, Sodium cyanide, Moderate, Steel strike, and Silver strip. He explained as he went along just how these solutions work and how to control them. He answered all questions for the members and we hope that he will come again soon.

Boston branch still continues to hold their after-meeting discussions until the gang is down to two.

ANDREW W. GARRETT, *Secy.*

Cincinnati Branch held its regular monthly meeting January 24 at 8:30 P.M., vice-president Harry Misner presiding.

A letter was read from Charles Conley relative to a joint meeting to be held by several branches of the A.E.S. There was much favorable comment on the plan and twelve members expressed a wish to attend such a meeting. Mr. Frank Nordman, the Librarian, said that he would write Mr. Conley and secure more information about the meeting. It was suggested that a questionnaire be sent to those members not in attendance to get their reaction on the joint meeting.

The application of Frank Schmerge, for associate membership was referred to the Board of Managers. The following were accepted as members: August Schwering, active; Russell Wiese, associate; and Edwin Woistmann, associate. Mr. Towner reported progress in the membership drive. The remainder of the evening was given over to Mr. B. F. Lewis, of The Northwest Chemical Company who had as his topic, "The Cleaning of Metals." The talk was thoroughly enjoyed by the twenty-six present.

MARTIN GANNON, JR., *Secy.*

Los Angeles Branch. The special meeting called for the evening of January 29, when this Branch had the pleasure of receiving a visit from Mr. Frederick Fulforth, Supreme President

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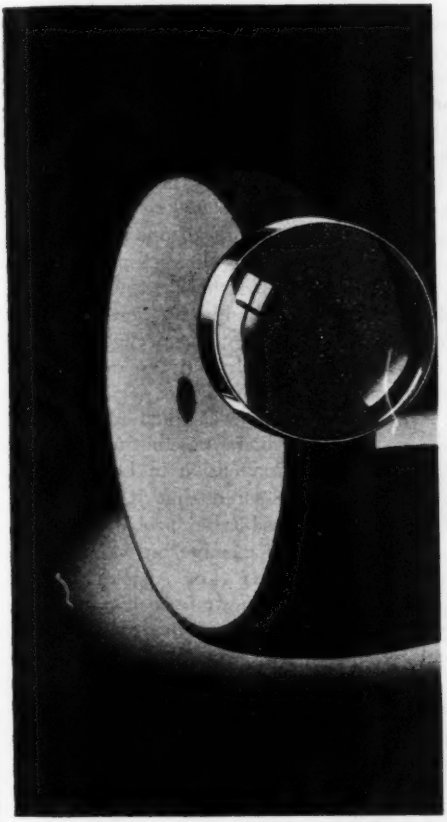

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of the A.E.S., was called to order by President Don Bedwell.

Don explained how our guest was delayed by bad weather, being forced to take a train instead of plane, then from train to dog sled, and finally having to finish the last lap on the back of a camel, but at last in spite of all difficulties he was here—the first active Supreme Officer to visit Los Angeles Branch, Supreme President Frederick Fulforth.

After his introduction Mr. Fulforth spoke of what the Society had to offer to those who are in or connected with the plating industry and he also reminded the members of the benefits and principles of the Society.

The applicants present were then asked to leave the room and the members voted to admit the entire group of twenty-two. They were then recalled and initiated by Supreme President Fulforth. According to Mr. Fulforth this is the largest class ever to be taken into an established Branch at one time. Quite in line with the usual Southern California custom.

Mr. Fulforth then presented his talk and film, "The Story of Steel For Plating Purposes;" the film through the courtesy of the Newman Crosby Steel Company. The talk and film were both extremely informative.

The Librarian then passed the Question Box and the following questions were found.

Q. What is the best way of eliminating spotting-out from cast red brass or bronze?

A. Rinse alternately in hot and cold water, or duplex copper to close pores of casting, then brass or bronze plate.

Q. What is a good hot bright nickel solution formula?

A. Practically all bright nickel solutions are patented and solutions can be obtained from the supply houses.

Q. Is there any simple way of accurately determining the thickness of anodic coatings?

A. No simple way known to anyone present. Refer to a paper presented by Dr. Junius D. Edwards in the 1939 Proceedings of the A. S. T. M.

Q. What is the best method of testing the thickness of nickel and chrome plate on brass?

A. The best method depends on the job at hand. Suggestions: peel plate and mike; magnegage method; optical method; and the drop or jet methods.

Mr. Fulforth was asked if he thought it would ever be possible to have the National Convention in Los Angeles. We were assured that it would not only be possible but probably the entire national membership would be in favor of it **IF** Los Angeles Branch would be willing to furnish transportation out here for at least 400 guests. However we were given considerable encouragement in the event that general business conditions continue to improve at their present rate. The branch members all hope that Mr. Fulforth finds it possible to visit us again.

ERVIN FRAUENHOFF, *Secy.*

Philadelphia Branch held its regular monthly meeting January 24, 1941, at the Harrison Laboratory, University of Pennsylvania. Librarian Zurback introduced Mr. William Schneider (Cyanide Bill) as the speaker of the evening. As Bill did not have a prepared talk ready on High Speed Brass Plating, he asked that the members join in a good discussion of the subject. Everyone at the meeting took an active part in the topic and High Speed Brass Plating was taken apart piece by piece.

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Mr. John Himes of Philadelphia Branch demonstrated the use of the Twing Albert Electro pH meter. A comparison of the Quinhydrone electro cell, pH papers and the colormetric comparator set proved an interesting subject and most of the members present took part in this experiment.

This talk was the first five-minute talk given before the branch by a practical plater who is a member of Philadelphia Branch. One of the "five-minute men" will speak at each meeting to stir up interest in the monthly meeting.

Five new members were elected to Philadelphia Branch and applications for seven more were read and turned over to the Board of Managers for consideration of membership next month. A total of eighteen new members to be elected to Philadelphia Branch in three months.

JOHN W. HIMES, *Secy.*

Pittsburgh Branch held its regular monthly meeting Thursday evening, February 6, at the University Club.

We had the largest attendance of this year to hear Mr. Mesle's talk "Evaluating Electroplating and Plating Procedure." Mr. Mesle discussed the adherence of coatings, current distribution, and methods for measuring both. A small hand tool developed by Mr. Mesle is used to pull a plated coating from the base metal and measure the pull required on an arbitrary scale. By this method the adhesion can be evaluated from 1 to 10, 10 being perfect adhesion. Mr. Mesle discussed tests made which indicate the adhesion on smooth surfaces to be better than on rough surfaces. He also showed results of improving the adhesion by heating specimens after plating. Current distribution and resultant metal distribution was described with samples and slides. Of the various methods for testing plate thickness, Mr. Mesle favors the chord method, which consists of grinding or filing through the plate with a circular file or wheel and measuring the chord of the arc. By knowing the radius of the wheel or file the depth of the plate can be computed.

Pittsburgh Branch will hold its first Banquet and Educational Session Saturday afternoon and evening, March 15. This will take the

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place of our regular meeting, March 6. The educational session will be held at 2:00 P.M. at Mellon Institute and the Banquet will be held at the University Club at 7:00 P.M. The educational session will consist of a talk by the head of the National Defense Committee in this district; moving pictures and a talk by Mr. A. B. Wilson; and a symposium on Technical Aids for the Electroplater. The symposium will include discussions by D. H. Rowland on Metallography, M. F. Behar on Temperature Control, B. B. Lustman on Diffusion, and one or two more men on subjects to be announced.

FRANK R. KELLER, *Secy.*

Toronto Branch held its regular monthly meeting February 7 at King Edward Hotel, Mr. Archie Smith in the chair opened the meeting with almost a full membership. Practically the whole evening was taken up with the trip to Niagara Falls, Ontario, for the Buffalo-Toronto joint meeting February 8. Jack Acheson and Allan Byers saw to it that no hitch was to occur and that everything was to go through per schedule.

Tom O'Keefe and Jim Graham gave the committee report for the annual banquet and card party March 14 and all the recommendations of the committee were adopted.

The application of Mr. Alex G. Clark was received and through the ballot box Mr. W. Rennie and Mr. James Fullerton were received into membership. Three members were suspended.

Along with a few visitors of the evening was Mr. A. Gordon, an old time member who took a great interest in the proceedings. Jim Valiere submitted sample RCAF wings that the members thought very well finished.

President Smith gave a blackboard talk on Covection Currents in a boiling cleaner solution; this was in conjunction with a question asked: *Should a cleaning solution be skimmed hot or cold?* This question caused the chairman to use his gavel for order. Everybody had something to say about it and the membership was divided on the question. It was decided that either method could be used.

JAMES S. CAIRNS.

Waterbury Branch met January 10 at the Hotel Elton. Thirty-one were present at the 6:30 dinner. The effervescent Mr. Richard Crane with his usual good fortune won the drawing for the free dinner. Forty-nine were present when the president, Ellsworth Candee, opened the meeting at 8:00 P.M. A communication from Apley N. Austin, secretary for the Hartford Branch, relative to the class in "Chemistry for Electroplaters" was read. This class is held Tuesday Evenings at the Hopkins High School in Hartford, and anyone interested may join. The fee will not exceed $6.00.

A business meeting will be held January 28th at the home of W. D. Starr, Scott Avenue, Watertown.

Mr. Cassel is getting material together for the exhibit at Boston. He is anxious to get all the displays together as soon as possible and those who intend to exhibit are urged to get in touch with him.

It was the opinion of those present that the cost of preprints was rather large and the value very small if they were distributed at the convention, as was done last year. Preprints to be worthwhile should be printed and distributed as the papers are received or at least a month in advance of the meeting. If this is done, it is the opinion of a majority of the Branch,

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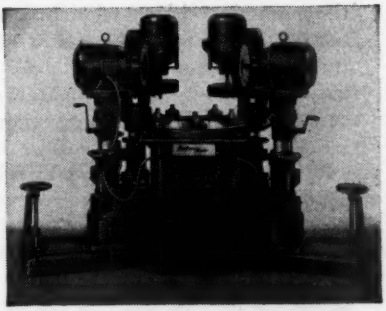

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preprinting will be a valuable addition to the educational session. However, preprinting cannot and should not take the place of the proceedings. The possibility of mimeographing instead of printing was suggested as a means of cutting the cost.

George Dubpernel reviewed the book "Metallic Corrosion Passivity and Protection" by Ulick R. Evans, published by Edward Arnold & Company. This book contains much practical information on corrosion; it has an excellent review of the properties of electrodeposits and what may be expected from them. The book is well indexed and contains an unusually large amount of readily accessible information.

Charles Mosgrove, acting as Technical Chairman, stressed the fact that we had considerable talent in our own branch to draw on for information, pointing out William Whitty, the speaker of the evening as an example. Charlie's statements were well borne out by the excellent paper given by Bill Whitty. He described in detail the care and precision used in the manufacture and finishing of stainless steel, the properties of stainless steels of varying compositions, and the methods best used by the fabricator to produce articles with the highest finish. The talk was preceded by a sound motion picture in color, which showed very clearly and in great detail the entire procedure in the manufacture of sheet, strip, rod, and tubing. A table of samples illustrated many of the products and the beautiful finish obtainable on stainless steel.

SPENCER L. HENN, *Secy.*

Milwaukee Branch held its 316th regular meeting at the Republican Hotel on Friday, February 7.

We received the application of Mr. Leslie Montanye of the Parker Pen Co., Janesville, and initiated Mr. Walter Weise as an associate member.

The Librarian decided that we would have no regular speaker for this meeting, but would have an informal question box. The following questions were found in the box.

Q. Why should peeling of nickel on the machined but unpolished portion of a brass casting, prevalent when using a 10% *HCl dip after the cleaning, be cured by the use of a one minute dip in* 50% *HCl?*

A. In view of the fact that scratch brushing the machined portion did not help, and that very little peeling was observed on the polished portion, it seems reasonable that the peeling is caused by a lead smear, which the strong HCl will remove.

Q. Would a rectifier be a suitable source of current for about 100 *amperes in gold plating?*

A. Yes.

Q. What treatment can be given sterling silver to prevent tarnishing?

A. Baking lacquer was suggested, as well as several types of dips, among them a chromic acid dip.

DEXTER F. RHODES, *Secy.*

Bridgeport Branch held its regular monthly meeting Thursday, February 6 at 8:00 P.M. at the Stratfield Hotel. President John E. Charleson opened the meeting.

Eugene Phillips Chairman of the Exhibit Committee reported that Clarence C. Helmle and Joseph G. Sterling would arrange a display (General Electric Co., Bridgeport, Conn.); Elmer Monson (Underwood Elliott Fisher Co., Bridgeport, Conn.); William A. Ehrencrona (Casco Products Co., Bridgeport, Conn.); Raymond J. O'Connor (Contract Plating Co., Stratford, Conn.);

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Clarence C. Helmle, Chairman of the Paper Committee, desires to help any member who wishes to present a paper at the Convention. Mr. Helmle also reported that the convention papers will be preprinted.

Mr. O'Connor named the following members to the Hotel and Banquet Committee: Eugene Phillips, Chairman, Arthur McNeil, David Dick, John Schneider, William A. Ehrencrona. Mrs. R. J. O'Connor was elected General Chairlady. She will name her committee to receive the ladies to our Regional Meeting with a promise of a good time for the ladies.

A Special Meeting was ordered by R. J. O'Connor to be held at Hotel Elton, Waterbury, March 1, with all members of the aforementioned Branches to be present at 2:00 P.M.

Librarian Clarence C. Helmle invited Mr. Milton C. Hodges of the Electrolux Company to speak. Mr. Hodges gave us a talk on "A Waste Disposal System," as recently installed by the Electrolux Company. This talk proved very interesting with a general discussion of the "Ifs" and "Whys" and Milton certainly knew the answers.

An Educational Session was held January 31 at the Stratfield Hotel with Clarence C. Helmle presiding—We had a good turnout with 52 members and visitors attending who heard Dr. Louis Weisberg of New York speak on "Hydrogen Absorption and Embrittlement in Electroplating." Subsequent discussion indicated that this subject is of utmost importance in its effect on pitting and adhesion of electrodeposits.

JOSEPH G. STERLING, *Secy.*

Springfield Branch held its regular monthly meeting at the Hotel Charles on January 27 at 8:00 P.M. The meeting was called to order by President Costigan. The minutes of the previous meeting were read and approved.

The secretary read a letter from Mr. Art Copp in which he expressed his appreciation for the flowers the Society had sent him and his wife when they were confined in the hospital. We were all pleased to learn that they are improving rapidly and expect to leave the hospital soon.

The application of Mr. J. F. Buckman, Enthone Company, New Haven, Conn. for associate membership was read and accepted. The application of Mr. Edwin Jarm, Lea Manufacturing Company, Waterbury was placed on file.

Mr. A. W. Wood, chairman of the educational committee for the plating class reported that the committee had contacted Mr. G. A. Burridge, Principal of the Trade School and that arrangements had been made to conduct the course at the Trade School under the supervision of the educational department of the National Defense Committee. The tuition will be paid by the government. The instructor will be Mr. Paul Lyman, Control Chemist at Westinghouse Electric & Manufacturing Company.

The secretary read a letter from Mr. A. Collins, Educational Chairman of the Boston Convention in which he requested that the Springfield Branch appoint a chairman to direct the preparation of a branch paper. Mr. A. Copp was appointed chairman of the committee. He will select his own assistants.

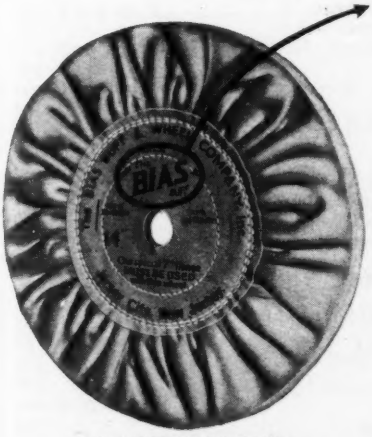
The president then introduced Mr. Ralph Pettit of the Aluminum Company of America who presented an extremely interesting paper entitled

"Aluminum and Its Finishes." Mr. Pettit traced the history of aluminum from its discovery and separation to the modern method of separation and fabrication. His talk was well illustrated with moving pictures, slides and samples of anodized and fabricated aluminum.

D. S. HARTSHORN, JR., *Secy.*

Baltimore-Washington Branch. The annual meeting and banquet of the Baltimore-Washington Branch took place at the Hotel Continental, Washington, D. C., on February 8, 1941. The event was a success, educationally, socially, and financially, thanks to our able committee composed of Messrs. Turner, Slattery, and Brenner. Dr. Brenner, presiding at the afternoon session, presented as speakers Messrs. Roehl of International Nickel, Hartshorn of The Enthone Company, Mullin of the Wright Aeronautical Corporation, and Candee of the American Brass Company. Mr. Hartshorn was handicapped by the absence of his star actress, a duck, but carried on capably nevertheless. Although overtime work kept many of our members away, both this and the dinner meeting were well attended, thanks to good weather and the attendance of many out-of-town friends. Supreme Vice-President Candee, Joe Barron, Dr. Walter Meyer, George Gehling, Wilfred McKeon, A. B. Hoefer and many others were welcome guests. A varied and brilliant entertainment program, followed by dancing, brought to a close what was acclaimed by many as our "best yet" meeting.

C. T. THOMAS, *Secy.*



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Membership Report

ELLSWORTH T. CANDEE, *Chairman, Membership Committee*

To February 1, 1941

ELECTIONS

Boston Branch

Willard P. Durgin, 340 Meridian St., E. Boston, Mass. Active

Cincinnati Branch

August S. Schwering, 3930 DeCoursey Ave., Rosedale, Ky. Active
Russell C. Wiese, 235 Triangle Ave., Dayton, Ohio. Associate
Edwin N. Woistmann, 2331 Victor St., Cincinnati, Ohio. Associate

Cleveland Branch

John Hallack, 277 East 156th St., Cleveland, Ohio. Active
William Henry, Trump Rd., N.E., Route #4, Canton, Ohio. Active
William Herbst, 9241 Birchdale Ave., Cleveland, Ohio. Active
Melvin E. Weaver, 127 E. Woodland Ave., Youngstown, Ohio. Active
George Winterstein, 3951 St. Clair Ave., Cleveland, Ohio. Active

Dayton Branch

Herbert M. Brown, 16 Edgar Ave., Dayton, Ohio. Associate
F. H. Thompson, 32 Watervliet Ave., Dayton, Ohio. Associate

Detroit Branch

Claud W. Morris, 18436 Northern Ave., Detroit Mich. Associate
Forrest T. Marx, 3725 Detroit Ave., Toledo, Ohio. Active

Hartford Branch

William E. Blankenburg, R.F.D. #1, Roberts St., New Britain, Conn. Active
Alfred Mastrianni, 136 East St., Plainville, Conn. Active
Wilfred Yeamans, 42 Tomlinson Ave., Plainville, Conn. Active
Herbert James Browne, 65½ Whiting St., Plainville, Conn. Active
John W. Hughes, 24 Charter Ave., Bloomfield, Conn. Active

Indianapolis Branch

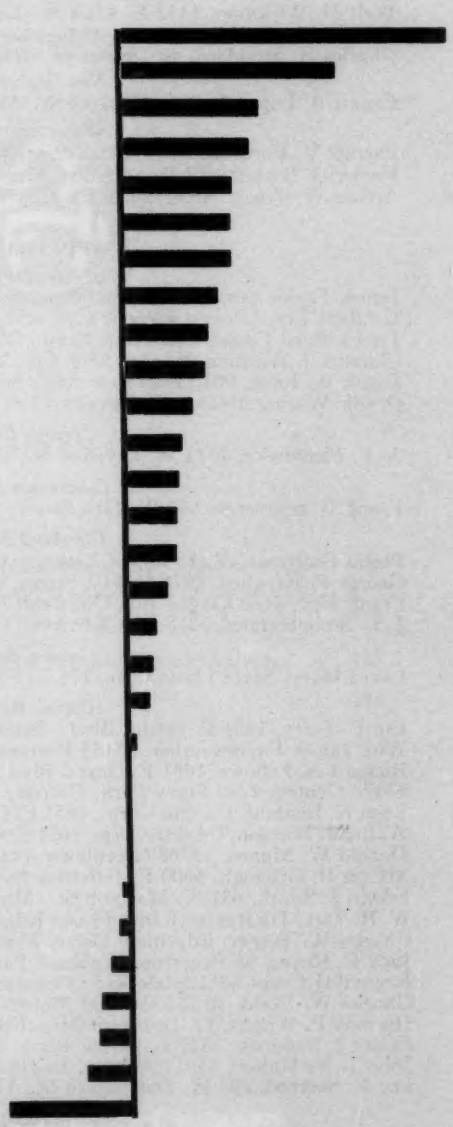
George H. Stinson, 825 N. Bradley St., Indianapolis, Ind. Active
Ray C. Christena, Allison Engineering Co., Indianapolis, Ind. Associate

Los Angeles Branch

James Bersano, 524 S. Avalon Blvd., Wilmington, Cal. Associate
Bruce J. Brooks, 1242 Valencia, Los Angeles, Cal. Associate
Milan M. Cahoe, 7006 King Ave., Bell, Cal. Active
Carl G. Campbell, 531 S. Alasendro, Temple City, Cal. Active
W. A. Hamilton, 339 N. Kingsley Dr., Los Angeles, Cal. Associate
Lew Hodges, 415 Loreta St., Los Angeles, Cal. Associate
Carl W. Jackson, 595 Farnam St., Los Angeles, Cal. Active
Bill Kendall, 536 W. 4th St., Downey, Cal. Associate
George H. Knepp, 734 E. Mountain St., Pasadena, Cal. Active
Frederic A. Maurer, General Electric Co., Ontario, Cal. Associate
Hugh Howard Morrell, 3621 W. 104th St., Inglewood, Cal. Active
Wesley Reis, 4423 Lovett St., Los Angeles, Cal. Associate
Charles A. Russill, 3838 S. Figueroa, Los Angeles, Cal. Active
Stanley M. Rynkofs, 525 N. La Brea Ave., Los Angeles, Cal. Active
Frank E. Shaw, Sr., 311 E. 59th Place, Los Angeles, Cal. Active
Frank E. Shaw, Jr., 311 E. 59th Place, Los Angeles, Cal. Active
Frank Sisto, 231 N. Robertson, Beverly Hills, Cal. Active

Membership Campaign

BRANCH	May 1, 1940	Change in Membership	Percent Change
Lancaster	25	+15½	+62
Los Angeles	59	+24	+40.8
Montreal	23	+6	+26.1
Springfield	51	+12½	+24.5
Dayton	62	+13	+20.9
Boston	79	+16½	+20.8
Grand Rapids	52	+10½	+20.2
Waterbury	66	+11½	+17.4
Rochester	62	+9½	+15.3
Cleveland	70	+10½	+15
Cincinnati	36	+4½	+12.5
Anderson	38	+4	+10.5
San Francisco	20	+2	+10
New York	102	+10	+9.8
Toledo	40	+3½	+8.8
Pittsburgh	34	+2½	+7.3
Newark	125	+6	+4.8
Milwaukee	84	+4	+4.7
Hartford	45	+2	+4.4
Philadelphia	133	+1½	+1.1
Bing.-Syracuse	22	0	0
Detroit	250	0	0
Prov.-Attleboro	38	0	0
St. Louis	77	—1	—1.3
Chicago	225	—3½	—1.6
Bridgeport	71	—2½	—3.5
New Haven	119	—6	—5
Toronto	67	—3½	—5.4
Baltimore-Wash.	49	—4	—8.2
Buffalo	57	—13	—22.8



MEMBERSHIP — May 1st, 1940 = 2181
MEMBERSHIP — Feb. 1st, 1941 = 2355
GAIN = 8.0%

NOTE: Honorary members are included with each Branch.

Virgil M. Stutzman, 4468 Century Blvd., Inglewood, Cal. Active
Joseph Sunderhaus, 3410 E. 8th St., Los Angeles, Cal. Active
E. W. Wells, 1917 Greenfield Ave., West Los Angeles, Cal. Associate
Walt H. Whitman, 1132 E. 42nd St., Los Angeles, Cal. Active

Milwaukee Branch

Charles H. Stoddard, 49 Detroit St., Hammond, Ind. Associate

New Haven Branch

Ernest A. Lappert, 126½ Pleasant St., Meriden, Conn.

Waterbury Branch

Patrick V. Romano, 93 Giles St., Waterbury, Conn. Associate
Frederick Batten, 677 Huntingdon Ave., Waterbury, Conn. Active
Arthur W. Tracy, American Brass Co., Waterbury, Conn. Associate

APPLICATIONS

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James Taylor Lumley, Contract Plating Co., Stratford, Conn. Active
I. Albert Lee, General Electric Co., Bridgeport, Conn. Associate
James Ward Cassel, Electrolux Corp., Old Greenwich, Conn. Active
Clarence J. Washing, Wiretex Mfg. Co., Mason St., Bridgeport, Conn. Assoc.
Frank W. Rock, 904 Longbrook Ave., Stratford, Conn. Associate
Orville Waring Mellick, University Club, Bridgeport, Conn. Associate

Chicago Branch

A. L. Pietrowicz, 1714 W. Division St., Chicago. Ill. Active

Cincinnati Branch

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Cleveland Branch

Philip Brotzman, R. F. D. #3, Geneva, Ohio. Active
George P. Kreglius, 2976 E. 81st Street, Cleveland, Ohio. Associate
Frank Roy, 4480 Clague Rd., Olmstead Falls, Ohio.
J. L. Stonebrenner, 5318 St. Clair Ave., Cleveland, Ohio. Associate

Dayton Branch

Lloyd Huey, State Plating Co., 171 E. Fifth Ave., Columbus, Ohio. Assoc.

Detroit Branch

Ed. F. Berry, 1651 E. Grand Blvd., Detroit, Mich. Associate
Wm. Junior Fayerweather, 15155 Piedmont, Detroit, Mich. Associate
Richard A. Fellows, 1651 E. Grand Blvd., Detroit, Mich. Associate
Floyd Gentry, 2243 Ferry Park, Detroit, Mich. Active
Leon K. Lindahl, Udylite Corp., 1651 E. Grand Blvd., Detroit, Mich. Assoc.
Walter J. Manson, Udylite Corp., 1651 E. Grand Blvd., Detroit, Mich. Assoc.
Donald W. Munro, 15768 Greenlawn Ave., Detroit, Mich. Associate
Myron H. Orbaugh, 6600 E. Jefferson Ave., Detroit, Mich. Active
Edwin J. Smith, 651 N. Macomb St., Monroe, Mich. Associate
W. H. Tart, Tin Research Ins., Fraser Rd., Greenford, Middlesex, Eng. Assoc.
Charles W. Yerger, Edgemere Drive, Matawan, N. J. Associate
Jack E. Keyes, 58 Brighton, Highland Park, Mich. Associate
Reginald J. Crane, 48 Oakdale Blvd., Pleasant Ridge, Royal Oak, Mich. Associate
Charles W. Dodd, 10-255 General Motors Bldg., Detroit, Mich.
Hermon P. Wright, % Ternstedt Mfg. Co., Detroit, Mich. Active
Elmer J. Paddock, 2832 E. Grand Blvd., Detroit, Mich. Associate
John J. McMahon, 14917 Aubrey, Brightmoor Sta., Detroit, Mich. Active
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